UC-NRLF
B 4 314 950

LIBRARY
OF THE
UNIVERSITY OF CALIFORNIA.
GIFT OF
Canada Geol. survey.
Class
BIOLOGY
LIBRARY
G

GEOLOGICAL AND NATURAL HISTORY SURVEY OF CANADA.
ALFRED R. C. SELWYN, C.M.G., LL.D., F.R.S., F.G.S., DIRECTOR.

CATALOGUE

OF

CANADIAN PLANTS.

PART VI.—MUSCI.

BY

JOHN MACOUN, M.A., F.L.S., F.R.S.C.,
Naturalist to the Geological and Natural History Survey of Canada.

PRINTED FOR THE GOVERNMENT OF CANADA.

MONTREAL:
WILLIAM FOSTER BROWN & CO.

1892.

Price, Twenty-five cents.

GEOLOGICAL AND NATURAL HISTORY SURVEY OF CANADA.
ALFRED R. C. SELWYN, C.M.G., LL.D., F.R.S., DIRECTOR.

CATALOGUE

OF

CANADIAN PLANTS.

PART VI.—MUSCI.

BY

JOHN MACOUN, M.A., F.L.S., F.R.S.C.,
Naturalist to the Geological and Natural History Survey of Canada.

LIBRARY OF THE UNIVERSITY OF CALIFORNIA

PRINTED FOR THE GOVERNMENT OF CANADA

WILLIAM FOSTER BROWN & CO., PUBLISHERS,
MONTREAL.
1892.

H 3
pt. 6-7

BIOLOGY
LIBRARY
G

Gift of
Canada Geol. Surv.

PREFACE.

From the spring of 1861 until the present, I have been collecting Canadian Musci, and in that time have traversed the continent many times. From 1861-1868, I collected in the central counties of Ontario, in 1869 under the auspices of the Natural History Society of Montreal, I spent nearly two months on the north and west shores of Lake Superior. In 1872, I collected from Lake Superior, westward to the Lake of the Woods, thence to Edmonton on the Saskatchewan, thence westward to Peace River in lat. 56°, and from there to Vancouver Island traversing nearly the whole length of British Columbia. The spring of 1875 was spent on Vancouver Island, and the summer occupied in collecting in British Columbia and along the whole length of the Peace River. The summers of 1879-80-81 were spent in Manitoba and the prairie region where many peculiar species were gathered. In 1882-83, I collected in Nova Scotia, Cape Breton, Anticosti and the Gaspé peninsula. The summer of 1884 at Lake Nepigon and the north shore of Lake Superior. The next summer (1885) collections were made in the Rocky and Selkirk Mountains on the line of the Canadian Pacific Railway. Vancouver Island was visited again in 1887, Prince Edward Island in 1888 and the summers of 1889-90 and 1891 were spent making exhaustive collections between the Pacific coast and the eastern base of the Rocky Mountains.

Important and interesting additions have also been made to the collections by the undermentioned gentlemen, including some new species :—

Dr. Robert Bell, of the Geological Survey Department, from Hudson Strait and Bay ; J. M. Macoun from the shores of Lake Winnipeg, the islands in Behring Sea, the coast of Alaska and British Columbia ; Mr. John Moser, of Caanan Forks, Queen's County, New Brunswick, from New Brunswick ; Mr. J. Dearness from around London, Ontario ; Rev. Charles A. Waghorne, of New Harbor, Newfoundland, from Newfoundland and Labrador.

From the foregoing it will be seen that the material for the present work has been accumulating for many years. In 1861 I commenced a correspondence with Sullivant, who was then working on his Icones Muscorum. After some years Mr. Coe F. Austin took up the

154522

subject, but failing health and an early death brought his work to a close. Meanwhile Prof. T. P. James rendered me valuable assistance and examined and determined many difficult species.

On the publication of Lesquereux & James' Manual of North American Mosses in 1884, I thought my difficulties were over, but with the increase of knowledge came the increased difficulty of separating the closely related species of Eastern Canada from those of the Rocky Mountains and Pacific Coast. It soon became evident that although this manual might be exhaustive for the United States, it was far from being so for Canada.

Up to 1885 I had, with the assistance of books and the above named authorities, catalogued a large number of species, and it was then decided to distribute sets of one hundred named Canadian mosses to test the accuracy of these determinations.

In 1857 I began to correspond with Professor Nils Conrad Kindberg, Ph. D., the distinguished bryologist of the State College, Linkoeping, Sweden, and we at once saw the value of the discoveries that were being made. With the greatest zest Dr. Kindberg entered into the examination of the large series of specimens we had collected, and the determinations, descriptions and notes on the species are his with very few exceptions. Dr. Carl Mueller, of Halle, the first authority among living bryologists, assisted Dr. Kindberg and reference to his collection, the richest in the world, greatly facilitated the work. Dr. Venturi has examined many specimens of the genus *Orthotrichum*, while Dr. Warnstorf, of Neuruppin, Germany, has examined all the specimens of *Sphagnum*, and it is from his determinations that the species have been named, compiled and arranged. Messrs. Renauld and Cardot have also given valuable assistance.

A duplicate of every specimen sent to Dr. Kindberg has been mounted and placed in the herbarium of this department so that almost every species, from each locality mentioned in the pages of the catalogue, is represented in its Museum.

The only lists published without the specimens referred to having been examined are those of Mr. C. N. St. Cyr, Department of Public Instruction, Quebec, Professor Alexander McKay, M.A., Dalhousie College, Halifax, Nova Scotia, and that of Professor James Fowler, D.D., Queen's College, Kingston, Ont.

In compiling the catalogue, Miquelon Island, Newfoundland, Greenland and Alaska have been included so as to embrace all the known northern species, and I trust the present catalogue may be useful for reference and stimulate others to follow up the foundation now laid, by additional works which will include the latest discoveries.

In conclusion, I wish to thank the collectors mentioned for their industry and material assistance. Especial thanks are due Dr. Kindberg for his gratuitous and unremitting labors in examining between 5,000 and 6,000 specimens from 1887 to the present time. Indeed without his assistance the work could never have been done so thoroughly and completely.

JOHN MACOUN.

Ottawa, June 16th, 1892.

ERRATA.

Page 6—For "Sphagnum Hendocinum" read "Sphagnum Mendocinum."

" 6—For "Sphagnum teres var. squarrosulum" read "Sphagnum teres var. squarrulosum."

" 62—For "Grimma" read "Grimmia."

" 63—For "Grimmia rlvularis" read "Grimmia rivularis."

" 196—For "*Hypnum relutinum*" read "*Hypnum velutinum*."

LIBRARY OF THE UNIVERSITY OF CALIFORNIA

MUSCI.

ORDER I. SPHAGNACEÆ. Peat Mosses.

SPHAGNUM.

(1.) **S. fimbriatum,** Wils., var. **tenue,** Gravet; Coult. Bot. Gaz. XV. 128.

S. fimbriatum, Wils.; Lesq. & James, Mosses of N. America, 14.

Miquelon Island. (*Delàmare.*) Bogs and swamps, Hampton, Kent Co., N.B. (*Fowler's Cat.*) Peat bog, Becscie River, Anticosti; Otter Pond, and at Tignish, Prince Edward Island; in a bog at the Race-course, Ottawa, Ont. (*Macoun.*)

Var. **arcticum,** C. Jensen.

Greenland; Mission Station, New Herrenhut. (*Spindler.*) Cape Chudleigh, Hudson Strait. (*R. Bell.*) Grand Harbor, Newfoundland. (*Rev. A. Waghorne.*)

(2.) **S. Girgenshonii,** Russ. Beit. p. 46. (1865); Coult. Bot. Gaz. XV. 128.

S. strictum, Lindb.; Lesq. & James, Mosses of N. America, 13; Canadian Musci, No. 6.

Miquelon Island. (*Delàmare.*) Champlain and Levis, Que. (*St. Cyr.*) Peat bog, Kingston, Kent Co., N.B. (*Fowler's Cat.*) Egg Mountain, Antigonish Co., N.S. (*J. Robert.*) Pictou Co., N.S. (*McKay.*) Peat bog near Truro, N.S.; wet woods rear of Beechwood, Ottawa; swamp at the base of the Oak Hills, Hastings Co., Ont.; on the portage path, four miles east of Kakabeka Falls, west of Lake Superior; peat

bog at Revelstoke, B.C. (*Macoun.*) Peat bog, Newboro, near Kingston, Ont. (*Prof. Lawson.*) Chicken Bay and Hopewell Bay, Newfoundland. (*Rev. A. Waghorne.*)

Var. **hygrophilum,** Warnst. (MS.)

In boggy woods north of Beechwood, Ottawa, Ont. (*Macoun.*) In bogs along Burnaby Lake near Hastings, B.C. (*J. M. Macoun.*)

(3.) **S. Russowii,** Warnst.; Coult. Bot. Gaz. XV. 130.

In bogs at Blaketown, Cooper's Road and Green Harbour, Newfoundland. (*Rev. A. Waghorne.*)

Var. **pœcilum,** Warnst.; Coult. Bot. Gaz. XV. 132.

Peat bogs, New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

Var. **rhodochroum,** Russ.; Coult. Bot. Gaz. XV. 132.

Peat bogs near Fredericton, N.B. (*Fowler.*)

Var. **Girgensohnioides,** Russ.; Coult. Bot. Gaz. XV. 132.

In a small peat bog in Roger's Pass, Selkirk Mountains, B.C.; alt. 4,500 feet. (*Macoun.*)

(4.) **S. fuscum,** (Schpr.) von Klinggraeff; Coult. Bot. Gaz. XV. 133.

Miquelon Island. (*Delàmare.*) Grand Lake, N.B. (*Fowler.*) Peat bogs, Newfoundland. (*Rev. A. Waghorne.*) Common in Hastings Co., Ont. (*Macoun.*)

Var. **fuscescens,** Warnst.; Coult. Bot. Gaz. XV. 135.

S. acutifolium, var. *fuscum,* Lesq. & James, in part.

Shelldrake River, Que. (*St. Cyr.*) Swamps, Bass River, Kent Co., N.B. (*Fowler.*) Quite common in peat bogs throughout northern Canada. Otter Pond, Prince Edward Island; Mer Bleue, and at the Race-course near Ottawa; peat swamps Hastings Co., Ont.; in a swamp near the Pic Lake Superior; in bogs at Stephen and Hector, Rocky Mountains; also in a bog at Langford Lake, Goldstream, Vancouver Island. (*Macoun.*)

Var. **pallescens,** Warnst. (MS.)

S. acutifolium, var. *fuscum,* Canadian Musci, No. 2.

Common in Mer Bleue near Ottawa; frequent in peat bogs, Hastings Co., Ont.; bogs, north of Edmonton, N.W.T.; peat bogs at Revelstoke and Craigellachie, Eagle Pass, B. C. (*Macoun.*) In a bog, summit of Mount Queest, B.C. Alt. 7,000 feet. (*J. M. Macoun.*)

(5.) **S. tenellum,** (Schpr.) von Klinggræff; Coult. Bot. Gaz. XV. 135.

Miquelon Island. (*Delàmare.*)

Var. **rubellum,** (Wils. as species.) Warnst.; Coult. Bot. Gaz. XV. 137.

S. rubellum, Wils.; Lesq. & James, Mosses of N. America, 13; Canadian Musci, No. 5.

Not uncommon in Nova Scotia. (*McKay.*) Peat bogs, Kingston, Kent Co., N.B. (*Fowler's Cat.*) In peat bogs at Belledune, N.B. (*Chalmers.*) Peat bog, Salt Lake, Anticosti; Otter Pond, Prince Edward Island; very abundant in the Mer Bleue near Ottawa; peat bogs, North Hastings, Ont.; bogs, Portage La Loche, N.W.T., lat. 57°. (*Macoun.*)

Var. **violaceum,** Warnst. (MS.)

In peat bog at Fredericton, N.B. (*Fowler.*)

(6.) **S. Warnstorfii,** Russ.; Coult. Bot. Gaz. XV. 138.

In small bogs by the borders of ponds Gaspé Co., Q. (*Macoun.*)

(7.) **S. quinquefarium,** (Braithw.) Warnst.; Coult. Bot. Gaz. XV., 189.

Peat bog, Mount Albert, Gaspé Co., Q., alt. 4,000 feet; in bogs, Port Dover, Lake Erie, Ont. (*Macoun.*)

(8.) **S. acutifolium,** (Ehrh. in part.) Russ. & Warnst.; Coult. Bot. Gaz., XV., 191; Canadian Musci, No. 1.

Very abundant in all peat bogs throughout Canada. Miquelon Island. (*Delàmare.*) Peat bog, Kent Co., N.B. (*Fowler.*) Common in Nova Scotia. (*McKay.*) Otter Pond, Prince Edward Island; Straits of Canso, and at Truro, N.S.; River Ste. Anne des Monts, Gaspé Co., Q.;

peat bogs, Mer Bleue and at the Race-course, Ottawa; Jupiter River and Salt Lake, Anticosti; common in the Rocky and Selkirk mountains, and westward to Vancouver Island. (*Macoun.*) Mountains east of Adams Lake, B.C., alt. 5,600 feet. (*Dawson.*) Bogs along the River Rouge, Argenteuil Co., Q. (*D'Urban.*) New Harbor, Newfoundland. (*Rev. A. Waghorne.*) In swamps, near London, Ont. (*J. Dearness.*)

Var. **versicolor,** Warnst.; Coult. Bot. Gaz. XV. 193; Canadian Musci, No. 3.

New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Bass River, Kent Co., N.B. (*Fowler.*) Peat bog, Mer Bleue and at the Race-course, near Ottawa; swamps, Oak Hills, Hastings Co., Ont.; in marshes, Porcupine Mountains, Man.; bogs near Lesser Slave Lake, N.W.T.; Peat bogs, Stephen and Hector, Rocky Mountains. (*Macoun.*)

Var. **pallescens,** Warnst.; Coult. Bot. Gaz. XV. 193; Canadian Musci, No. 4.

In the hollows of granite rocks on a small island off the north-east coast of Lake Superior, nearly opposite the lower end of Michipicoten Island; peat bog, Mer Bleu, near Ottawa. (*Macoun.*)

Var. **rubrum,** Warnst. (MS.)

Peat bogs, Lake Nepigon, Ont. (*Macoun.*) Cooper's Road, New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

Var. **purpurascens,** Warnst.

In a peat bog, Jupiter River, Anticosti, Que. (*Macoun.*)

(9.) **S. subnitens,** Russ. & Warnst. var. **flavicomans,** Card.; Coult. Bot. Gaz., XV., 196.

Miquelon Island. (*Delàmare.*)

(10.) **S. Lindbergii,** Schpr.; Coult. Bot. Gaz., XV., 217.

Canada, Newfoundland and Greenland. (*Warnstorf.*) Miquelon Island. (*Delàmare.*)

(11.) **S. riparium,** Aongstr.; Coult. Bot. Gaz., XV., 217.

Greenland, New Herrenhut. (*Spindler.*) Kotzebue Sound, Alaska. (*Seeman.*) In boggy spots in Roger's Pass, Selkirk Mountains, B. C.; alt. 4,500 feet. (*Macoun.*)

(12.) **S. recurvum,** (P. B.) Russ. & Warnst. var. **pulchrum,** Lindb.; Coult. Bot. Gaz., XV., 218.

Miquelon Island. (*Delàmare.*) Wet woods along the Mere Bleu, near Ottawa; shore of Gull Lake, Frontenac Co., Ont.; bogs Portage La Loche, lat. 57° and near Lesser Slave Lake, N.W.T. (*Macoun.*) New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

Var. **mucronatum,** Russ.; Coult. Bot. Gaz. XV. 218.

In a peat bog at Brackley Point, Prince Edward Island; wet woods along the Mer Bleue, near Ottawa; in peat bogs, Peterboro Co., Ont. (*Macoun.*) Grand Lake, N.B. (*Fowler.*) In swamps, Canaan Forks, N.B. (*J. Moser.*) New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

Var. **amblyphyllum,** Russ.; Coult. Bot. Gaz. XV. 218; Canadian Musci, No. 7.

Bass River, Kent Co.; in ponds at Richibucto, N.B. (*Fowler.*) Abundant in Otter Pond, Prince Edward Island; peat bog, Kingston, N.S.; borders of ponds, Mer Bleue, near Ottawa; peat swamps, Hastings Co., Ont. (*Macoun.*)

Var. **parvifolium,** (Sendt.) Warnst.; Coult. Bot. Gaz. XV. 219.

Peat bogs, Hastings Co., Ont.; peat bog, Mer Bleue, near Ottawa; Langford Lake, Vancouver Island. (*Macoun.*) In bogs, New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

(13.) **S. cuspidatum,** (Ehrh.) Russ. & Warnst. var. **Torreyanum,** Sulliv.; Coult. Bot. Gaz., XV., 220.

Miquelon Island. (*Delàmare.*)

Var. **Miquelonense,** Ren. & Card.; Coult. Bot. Gaz. XV. 220.

Miquelon Island. (*Delàmare.*)

Var. **falcatum,** Russ.; Coult. Bot. Gaz. XV. 221.

Miquelon Island. (*Delàmare.*)

Var. **submersum,** Schpr.; Coult. Bot. Gaz. XV. 221.

In Otter Pond, Prince Edward Island. (*Macoun.*)

Var. **plumosum,** Bryol. Germ.; Coult. Bot. Gaz. XV. 221.

In peat bogs, Salt Lake, Anticosti, Que. (*Macoun.*)

(14.) **S. Hendocinum,** Sull. & Lesq.; Coult. Bot. Gaz., XV., 221; Canadian Musci, No. 8.

In a peat bog, at Salt Lake, Anticosti; in a bog at Wellington Mine, Departure Bay, Nanaimo, Vancouver Island. (*Macoun.*)

(15.) **S. squarrosum,** Pers.; Coult. Bot. Gaz. XV. 223.

Abundant in wet places in woods in Hastings and Northumberland Co's., Ont. (*Macoun.*)

Var. **spectabile,** Russ.; Coult. Bot. Gaz., XV., 223; Canadian Musci, No. 10.

Mountain bogs, Roger's Pass, Selkirk Mountains, B. C.; Albert Cañon, Illicillewaet River, B.C.; peat bogs, Hastings Co., Ont. (*Macoun.*) Grand Lake, N.B. (*Fowler.*)

Var. **semisquarrosum,** Russ.; Coult. Bot. Gaz. XV. 224.

Metis, St. Lawrence River, Quebec. (*Pringle.*) Bass River, Kent Co., N.B. (*Fowler.*) Boggy woods, Salt Lake, Anticosti; bogs at Sudbury Junction, Ont.; wet woods near London, Ont.; in bogs at Revelstoke, B.C. (*Macoun.*)

Var. **speciosum,** Russ.

In peat bogs at Tignish, Prince Edward Island; damp woods near Ottawa and the Mer Bleu; common in wet, swampy woods, near Belleville, Hastings Co., Ont. (*Macoun.*) In bogs by Burnaby Lake, Hastings, B.C. (*J. M. Macoun.*)

Var. **imbricatum,** Schp.

Bogs, Portage La Loche, lat. 57°, and near Lesser Slave Lake, N. W.T. (*Macoun.*)

(16.) **S. teres,** Aongstr.; Coult. Bot. Gaz., XV. 224.

Miquelon Island. (*Delàmare.*)

Var. **imbricatum,** Warnst.; Coult. Bot. Gaz. XV. 224.

Peat bog along the Eagle River a little west of Craigellachie, B. C. (*Macoun.*) Peat bog, Mount Queest, Gold Range, B.C. (*J. M. Macoun.*) Cape Prince of Wales and Stupart's Bay, Hudson Strait. (*R. Bell.*)

Var. **squarrosulum,** Lesq.; Coult. Bot. Gaz. XV. 224.

In a swamp 15 miles west of Port Arthur, Lake Superior. (*Macoun.*)

(17.) **S. Wulfianum,** Girg.; Coult. Bot. Gaz., XV., 225; Canadian Musci, No. 11.

Quite common in boggy woods, Hastings Co., Ont.; peat bogs, Sudbury Junction, Ont.; in bogs along Lesser Slave Lake, N.W.T. (*Macoun.*)

Var. **versicolor,** Warnst.; Coult. Bot. Gaz. XV. 225.

Peat bog, Portage La Loche, N.W.T., lat. 57°. (*Macoun.*)

Var. **macroclada,** Warnst. (MS.)

Damp woods in rear of Beechwood Cemetery, Ottawa, Ont. (*Macoun.*)

Var. **viride,** Warnst.; Coult. Bot. Gaz. XV. 225.

Wet places at the Race-course, Ottawa, Ont. (*Macoun.*)

(18.) **S. compactum,** DC.; Coult. Bot. Gaz., XV., 226; Canadian Musci, No. 12.

Miquelon Island. (*Delàmare.*) Cap St. Ignace, Montmagny, Que. (*St. Cyr.*)

Var. **subsquarrosum,** Warnst.; Coult. Bot. Gaz. XV. 226.

Peat bog near Campbellton, N.B.; bogs, Brackley Point and Tignish, Prince Edward Island; bogs along Nepigon River, Ont.; peat bogs along Lesser Slave Lake, N.W.T. (*Macoun.*)

Var. **squarrosum,** Russ.; Coult. Bot. Gaz. XV. 226.

In peat bogs, Kingston, N.B. (*Fowler's Cat.*)

Var. **papillosum,** Warnst. (MS.)

In peat bogs, Portage La Loche, lat. 57°, N.W.T. (*Macoun.*)

(19.) **S. Carberi,** Lesq. & James, Mosses of N. America, 18.

Come by Chance, Placentia Bay, Newfoundland. (*Rev. A. Waghorne.*)

(20.) **S. Pylaiei,** Brid.; Coult. Bot. Gaz., XV., 242.

Newfoundland. (*Pylaie.*) Miquelon Island. (*Delàmare.*)

Var. **ramosum,** Warnst., forma **nigricans,** Brid.; Coult. Bot. Gaz. XV. 243.

Miquelon Island. (*Delàmare.*) Placentia Bay, Newfoundland. (*Rev. A. Waghorne.*)

(21.) **S. subsecundum,** Nees.; Coult. Bot. Gaz., XV., 246; Canadian Musci, No. 13.

Bass River, Kent Co., N.B. (*Fowler.*) Bog along Hooper's Lake, Hastings Road, North Hastings, Ont.; wet woods, Point aux Pins, Lake Superior; marsh by Gull Lake, Victoria Co., Ont.; bogs, Lake Nepigon, Ont. (*Macoun.*) In marshy spots, Canaan Forks, N.B. (*J. Moser.*)

(22.) **S. rufescens,** Bryol. Germ.; Coult. Bot. Gaz., 246.

In peat bogs at Truro and Kingston, N.S. (*Macoun.*) New Harbor Brook, Newfoundland. (*Rev. A. Waghorne.*)

(23.) **S. imbricatum,** (Hornsch.) Russ.; Coult. Bot. Gaz., XV., 249.

Miquelon Island. (*Delàmare.*)

Var. **cristatum,** Warnst.; Coult. Bot. Gaz. XV. 250.

Peat bogs at Louisburg, Cape Breton, N.S. (*Macoun.*)

Var. **affine,** (Ren. & Card.) Warnst; Coult. Bot. Gaz. XV. 250.

Boggy meadows, near Truro, N. S. (*Macoun.*) In boggy places, Canaan Forks, N.B. (*J. Moser.*)

(24.) **S. cymbifolium,** Ehrh.; Coult. Bot. Gaz. XV. 251.

Very common in peat bogs throughout Ontario, but seldom separated from the variety. (*Macoun.*) Old Ship, New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

Var. **læve,** Warnst.; Coult. Bot. Gaz., XV., 250; Canadian Musci, No. 9.

Peat bogs, Brackley Point, and Otter Pond, Prince Edward Island; abundant in the Mer Bleue and at the Race-course, near Ottawa; common in bogs, Hastings Co., Ont.; Port Dover, Lake Erie, Ont.; boggy woods near Hastings, B.C.; also on Mount Arrowsmith, Vancouver Island. (*Macoun.*)

(25.) **S. papillosum,** Lindb.

Miquelon Island. (*Delàmare.*) Bogs, Truro, N.S. (*Macoun.*) In bogs at Canaan Forks, N.B. (*J. Moser.*) Centre Hill, New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

Var. **læve,** Warnst. (MS.)

In bogs, Victoria Co., Ont. (*Macoun.*)

Var. **sublæve,** Limpr.

In bogs, Hastings Co., Ont. (*Macoun.*)

(26.) **S. medium,** Limpr. Var. **læve,** forma **purpurascens,** Russ.; Coult. Bot. Gaz., XV., 252; Canadian Musci, No. 15.

Bass River, Kent Co., N.B. (*Fowler.*) Otter Pond, Prince Edward Island; peat bog, Mer Bleue near Ottawa; abundant in peat swamps at Belleville, Ont.; peat bogs along Lake Nepigon, Ont.; peat bogs along Lesser Slave Lake, N.W.T. (*Macoun.*)

Var. **pallescens,** Warnst. (MS.)

Otter Pond, Prince Edward Island. (*Macoun.*) Bogs, Newboro, near Kingston, Ont. (*Prof. Lawson.*)

Var. **roseum,** Warnst. (MS.)

Grand Lake, N.B. (*Fowler.*)

(27.) **S. molluscum,** Bruch.; Canadian Musci, No. 14.

S. tenellum, Lesq. & James, Mosses of N. America, 20.

New Harbor, Newfoundland. (*Rev. A. Waghorne.*) In peat bogs, Salt Lake, Anticosti; peat bog near the summit of Mount Arrowsmith, Vancouver Island; alt. 5,400 feet. (*Macoun.*)

ORDER II. ANDREÆACEÆ. Schizocarpous Mosses.

2. ANDREÆA, Ehrhart.

(28.) **A. petrophila,** Ehrh.; Lesq. & James, Mosses of N. America, 25; Canadian Musci No. 16.

In small, fragile, olive-green tufts on granitic and other metamorphic rocks across the continent. Truro, N.S.; Sudbury Junction, Lake Superior and Lake Nepigon, Ont.; Hector, Rocky Mountains; Roger's Pass, Selkirk Mountains, and on the Gold Range at Griffin Lake, B.C.; Mounts Benson and Arrowsmith, Vancouver Island. (*Macoun.*) Smith's Sound. Lat. 78—82°. (*Dr. Hayes.*) Jakobshavn, Greenland. (*R. Brown.*)

(29.) **A. alpestris,** Schimp. Br. Europ. VI. t. 4.

A. petrophila, Ehrh. var. *alpestris,* Thed. ; Braithw. Brit. Moss-Fl. I. 8.

Differs from *A. petrophila* in the tufts being black and somewhat glossy in the dry state, the leaves smaller, less distinctly papillose, when dry closely imbricated, the upper leaf cells one-half smaller.

New to America. On damp rocks, North West Arm, Halifax, N.S., June 18th, 1883. (*Macoun.*) Christianshaab, Greenland. (*Fl. Gr.*)

(30.) **A. Huntii,** Limpr. Laubm. Deutschl. 145.

Differs from *A. crassinervis* principally in the subula of the leaf, only about a half formed by the costa, and the very papillose perigonial and perichetial leaves, also in the larger capsule.

This species is often confounded with *A. Rothii*, Web. & Mohr. On rocks, Mount Arrowsmith, Vancouver Island. Alt. 5,500 feet. July 18th, 1887. (*Macoun.*) New to America.

(31.) **A. obovata,** Thed. ; Greenland Flora, 399.

Disco Island, Greenland. (*Fl. Gr.*)

(32.) **A. Blyttii,** Schimp. ; Greenland Flora, 400.

Jakobshavn, Greenland. (*Fl. Gr.*)

(33.) **A. crassinervia,** Bruch ; Lesq. & James Mosses of N. America, 26.

Greenland. Godhavn. (*Fl. Gr.*)

(34.) **A. Macounii,** Kindb. ; Bull. Torr. Bot. Club, April, 1890.

Stem elongate, about 5 c. m. high. Tufts soft well cohering, dark brown or brick-red, not glossy. Leaves narrow from the broader base suddenly long acuminate, distinctly but faintly papillose, more or less curved, the uppermost falcate, when dry subcrispate ; cells uniform subquadrate ; costa narrow, linear, nearly smooth, in the upper leaves long-excurrent and denticulate, sometimes to the middle. Dicœcious.

This lovely species is closely allied to the European *A. nivalis*, Hook. ; but the leaves are narrower and very much less papillose, principally on the stouter, more defined, purple-red and often excurrent costa.

In cushions and flat mats on the inclined faces of rocks on the

mountains and by brooks flowing from perpetual snow on the Gold Range north of Griffin Lake, B.C. Alt. 7,500 feet. August 8th, 1889. (*Macoun.*)

(35.) **A. parvifolia,** C. Muell. Flora, (1887) 14.

Alaska. (*Roth. Alask.*)

ORDER III. BRYACEÆ. True Mosses.

Series I. Acrocarpi.

TRIBE I.—PHASCEÆ.

3. EPHEMERUM, Hampe.

(36.) **E. minutissimum,** Lindb. Manip. Musc. II. 411.

E. serratum, Hampe. Var. *angustifolium,* Schimp.; Lesq. & James, Mosses of N. America, 38 ; Canadian Musci No. 465.

Phascum serratum, Drummond Musc. Bor.-Am. No. 10.

On earth at Carleton House on the Saskatchewan, N.W.T. (*Drummond.*) Abundant on inundated ground along the outlet of Leamy's Lake, near Hull, Que. (*Macoun.*)

4. SPHÆRANCIUM, Schimp.

(37.) **S. triquetrum,** (Spruce.) Schimp. ; Lesq. & James, Mosses of N. America, 41.

Phascum muticum, Drumm. Musc. Bor.-Am. No. 8.

On earth at Carleton House on the Saskatchewan, N.W.T. (*Drummond.*)

5. PHASCUM, Linn. (in part.)

(38.) **P. piliferum,** Schreb. Phasc. t I. fig. 7.

P. cuspidatum, Schreb. var. *piliferum,* Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 42.

P. cuspidatum, Drumm. Musc. Bor.-Am. No's. 5 and 7.

(No. 5) On the borders of Stony Lake, Rocky Mountains. (No. 7) Plains at Carleton House on the Saskatchewan, N.W.T. (*Drummond.*)

(39.) **P. subexsertum,** Hook. (n. sp.) Drumm. Musc. Bor.-Am., No. 9.

"Acaule cæspitosum foliis lingulato-oblongis patentibus apiculatis, capsulis subexsertis sphæricis apice acuminatis. Hooker."

Carlton House, Saskatchewan, N.W.T. (*Drummond.*)

6. ARCHIDIUM, Brid.

(40.) **A. Ohioense,** Schimp.; Lesq. & James, Mosses of N. America, 50.

On inundated soil at the outlet of Leamy's Lake, near Hull, Que. (*Macoun.*)

TRIBE II. WEISIEÆ.

7. ASTOMUM, Hampe.

(41.) **A. crispum,** Hampe.; Lesq. & James, Mosses of N. America, 51.

Phascum crispum, Hedw.; Drumm. Musc. Bor.-Am. No. 11.

Moist places on the plains of the Saskatchewan, N.W.T. (*Drummond.*)

(42.) **A. Drummondii,** Kindb.

Gymnostomum phascoides, Hook. (n. sp.); Drumm. Musc. Bor.-Am. No. 12.

"Subacaule cæspitosum, foliis lineari-subulatis integerrimis, seta foliorum longitudine, capsulis globosis operculo conico rostrato. Hooker."

Plains of the Saskatchewan, in moist places. (*Drummond.*)

8. GYMNOSTOMUM, Hedw.

(43.) **G. calcareum,** Nees & Hornsch.; Lesq. & James, Mosses of N. America, 53.

G. tortile, Drummond, Musc. Bor-Am. 23.

Quite common on moist calcareous rocks at Owen Sound, 1874; also on calcareous rocks near the Whirlpool, Niagara Falls. (*Macoun.*) Limestone rocks, Lake Winnipeg. (*Drummond.*) Pictou Co., N.S. (*McKay.*) On rocks, New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

Var. **brevifolium,** Schimp.; Lesq. & James, Mosses of N. America, 53.

On calcareous earth along the Moira River above Belleville, Ont., 1863. (*Macoun.*)

(44.) **C. rupestre,** Schwaegr.; Lesq. & James, Mosses of N. America, 53; Drumm. Musc. Bor.-Am. No. 24.; Canadian Musci No. 18.

Schistose rocks on the Columbia River, and on rocks on the borders of Lake Winnipeg. (*Drummond.*) On rocks along the Nepigon River north of Lake Superior, 1884, and near the Whirlpool, Niagara Falls; crevices of rocks, Mount Stephen, Rocky Mountains; crevices of rocks, Deer Park, Lower Arrow Lake and at Sproat Mountain, Columbia River, B.C. (*Macoun.*)

Var. **stelligerum,** Schimp.; Lesq. & James, Mosses of N. America, 53.

On calcareous rocks along the Gaspé Coast, River St. Lawrence, 1882. (*Macoun.*)

(45.) **C. curvirostrum,** Hedw.; Lesq. & James, Mosses of N. America, 54; Drumm. Musc. Bor.-Am. No's. 25 and 26; Canadian Musci No. 17.

On dripping rocks throughout Canada. Alpine rocks, common; and at Niagara Falls. *Drummond.*) Clefts in rocks at Cape Tourelle, near Ste. Anne des Monts, Gaspé Co., Que. (*J. A. Allen.*) South-west Point and Gunn River, Anticosti, 1883; Little Fox River, Gaspé, Que.; Sydenham Falls, Owen Sound, Ont.; calcareous springs, Hudson Hope, Peace River, 1872; also at Morley and Kicking Horse Lake, Rocky Mountains, 1885. (*Macoun.*) Limestone rocks, Clearwater River, N.W.T. Lat. 57°. (*J. M. Macoun.*) Crevices of rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C. (*Macoun.*)

(46.) **C. platyphyllum,** Kindb.; Bull. Torr. Bot. Club, April, 1889; Canadian Musci No. 506.

Dicœcious. Plants green, not glossy. Stem not papillose, sparingly radiculose, leaves decurrent, distinctly papillose, short, obtuse, oblong-lanceolate, the comal greater, one border often recurved all around; costa greenish yellow, very papillose.

Collected June 16th, 1889, on the face of a small water-fall in the brook that flows into the Thompson just west of Kamloops, B.C.

The falls are less than half a mile south of the C. P. R. Railway. (*Macoun.*)

(47.) **C. tenue,** Schrad. ; Lesq. & James, Mosses of N. America, 54 ; Drumm. Musc. Bor.-Am. No. 21.

Limestone rocks of Lake Winnipeg. (*Drummond.*) On the "Great Trent Boulder" three miles above the Railway Bridge (west side) near Trenton, Ont., 1866 ; on calcareous rocks at Owen Sound, Ont., 1871. (*Macoun.*)

9. EUCLADIUM, Bryol. Europ.

(48.) **E. verticillatum,** Bryol. Europ.

On calcareous tufa deposited by the "Warm Springs" on the west side of Kootanie Lake, B.C., 1890. (*Macoun.*) New to America.

10. ANŒCTANGIUM, Schwaegr. (in part.)

(49.) **A. compactum,** Schwaegr. ; Greenland Flora, 398.

Greenland. (*Fl. Gr.*)

11. WEISIA, Hedw.

(50.) **W. viridula,** Brid. ; Lesq. & James, Mosses of N. America, 55 ; Canadian Musci No. 515.

W. controversa, Drumm. Musc. Bor.-Am. No. 67.

Tay, York Co., and Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On the ground in the plains of Carleton House, Saskatchewan, N.W.T. (*Drummond.*) On earth along the high bank, south of the railway crossing in Belleville, Ont., 1864 ; on earth in woods at Leamy's Lake, near Hull, Que., 1889 ; on earth at Victoria, Vancouver Island. (*Macoun.*) On earth at London, Ont. (*J. Dearness.*)

(51.) **W. convoluta,** C. M. & Kindb. (n. sp.)

Tufts dense, dark green. Stem slender, branching, densely foliate. Leaves very patent when moist, flexuous, from a broader oblong base narrowed into the very narrow and long often piliform acumen, margins entire and erect ; cells small, quadrate chlorophyllose opaque ; costa very thin, vanishing in the acumen. Perichetial leaves broader vaginant at the base, shorter than the other, densely appressed

involving the pedicel; capsule cylindric, very narrow, faintly curved; lid obliquely rostrate; pedicel yellowish, elongate, slender, spirally twisted, narrowed to the capsule.

This species differs from *Weisia viridula* principally in the longer, narrower capsule, the leaves not involute and in the not excurrent costa.

Crevices of rocks near the summit of Copper Mountain south of Bow River, at Silver City, Rocky Mountains. Alt. 7,700 feet. 1885. (*Macoun.*)

12. DICRANOWEISIA, Lindb.

(52.) **D. crispula,** Lindb.; Lesq. & James, Mosses of N. America, 57; Canadian Musci No. 477.

Weisia crispula, Hedw.; Drumm. Musc. Bor.-Am. No. 69.

On rather dry rocks in a ravine, Mount Albert, Gaspé Co., Que. (*A. J. Allen.*) Rocks among the Rocky Mountains. (*Drummond.*) Mountains south-west of Kamloops, B.C., 1888. (*Dawson.*) Dry rocks along the C. P. Ry., three miles west of Hector, Rocky Mountains, 1885, and on rocks in Roger's Pass, Selkirk Mountains, B.C. (*Macoun.*) Smith's Sound. (*Dr. Kane.*) Godhavn, Greenland. (*R. Brown.*)

(53.) **D. cirrhata,** Lindb.; Lesq. & James, Mosses of N. America, 57. Canadian Musci No. 19.

On rocks near Johnston Strait, Gulf of Georgia, B.C. (*Dawson.*) Very common on rocks and prostrate trunks in all parts of Vancouver Island, 1887; on dead wood at Hastings, B.C., 1889; on rocks at the Hot Springs, Kootanie Lake, B.C., also on rocks at Deer Park, Lower Arrow Lake, Columbia River. (*Macoun.*)

13. OREOWEISIA, Schimp.

(54.) **O. serrulata,** Schimp.; Lesq. & James, Mosses of N. America, 58.

Nulato, Alaska, (*Roth. Alask.*) On wet rocks along the shore of Lake Superior, ten miles south of Port Arthur, 1869. (*Macoun.*)

Var. **tenuior,** Kindb. (n. var.)

On rocks by the torrent at Hector, Rocky Mountains. (*Macoun.*)

14. RHABDOWEISIA, Bruch & Schimp.

(55.) **R. fugax,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 59.

On rocks at Sudbury Junction, 1884, north shore of Lake Superior at Pic River, 1869, and on rocks, Lake Nepigon, 1884; limestone rocks, Owen Sound, Ont. (*Macoun.*)

(56.) **R. denticulata,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 59.

Weisia striata, Drumm. Musc. Bor.-Am. No. 68.

Near New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Abundant below Norway House, about Lake Superior and in the Rocky Mountains. (*Drummond.*)

15. CYNODONTIUM, Schimp.

(57.) **C. Schisti,** Schimp.; Lesq. & James, Mosses of N. America, 59.

Rocky Mountains. (*Drummond,* vide *Lesq. & James.*) Upernivik, Greenland. (*Fl. Gr.*)

(58.) **C. gracilescens,** Schimp.; Lesq. & James, Mosses of N. America, 60.

Upernivik, Greenland. (*Fl. Gr.*)

(59.) **C. alpestre,** Wahlenb.

C. gracilescens, Schimp.; var. *alpestre,* Schimp.; Lesq. & James, Mosses of N. America, 60.

Very likely does not occur in Canada. Occurs in Greenland at Christianshaab. (*Fl. Gr.*)

(60.) **C. (Oncophorus) strumulosum,** C. M. & Kindb. (n. sp.)

Tufts bright green, 1-2 cm. high. Leaves crisped, sub-linear, blunt or sub-acute, recurved at the basal margins, crenulate above, nearly pellucid; basal cells linear, the other short, angular; costa very papillose at back, not percurrent. Perichetial leaves short-acuminate. Capsule small, oblique, oblong-ovate, inclined, when dry furrowed, distinctly strumose; teeth not papillose, cleft to the middle, reddish also in the upper part; annulus distinct; pedicel light red or yellow, straight, 1 cm. long.

On a limestone ledge along the mountain torrent that enters Kicking Horse Lake, two hundred yards from the railway station at Hector, Rocky Mountains, Aug. 13th, 1890. (*Macoun.*)

(61.) **C. subalpestre,** Kindb. (n. sp.) MS.

C. gracilescens, Schimp. ; Canadian Musci. No. 20.

Dicranum gracilescens, Austin Musc. Appal. Suppl. I., No. 467.

On the rocks near the sea-shore, Whale Island, Forteau Bay, lat. 51° 49′, Labrador ; also Forks of the Ste. Anne des Monts River, Gaspé Co., Que. (*J. A. Allen.*) Shore of Lake Huron, near the Fishing Islands ; quite common on rocks north shore of Lake Superior and on rocks on the islands in Lake Nepigon and along the " Dawson Route " west of Lake Superior. (*Macoun.*)

(62.) **C. polycarpum,** Schimp. ; Lesq. & James, Mosses of N. America, 60 ; Canadian Musci No. 21, in part.

Dicranum Scottianum, Drumm. Musc. Bor.-Am. No. 102.

On the bases of trees, Rustico Bay, Prince Edward Island, 1888 ; on logs along the Moira River, at Belleville, Ont., 1870 ; on rocks, Mount Erskine, Salt Spring Island, Gulf of Georgia, 1887, and on rocks, North Arm, Burrard Inlet, B.C., 1889. (*Macoun.*) On rotten wood, London, Ont. (*J. Dearness.*) Lake Superior, 1848. (*Agassiz.*) Roots of trees. Ontario. (*Drummond.*) Topsail Harbor, Newfoundland. (*Rev. A. Waghorne.*) At Pictou, N.S. (*Fowler's Cat.*) Alaska. (*Roth. Alask.*) Jakobshavn, Greenland. (*R. Brown.*)

(63.) **C. strumiferum,** (Ehrh.) De Not. Epil. 280 (1869.)

C. polycarpum, Schimp. ; var. *strumiferum,* Schimp. ; Lesq. & James, Mosses of N. America, 60 ; Canadian Musci No. 21, in part.

Dicranum strumiferum, Drumm. Musc. Bor.-Am. No. 107.

On decaying wood at Wooler, Ont., 1888 ; on damp rocks, Lake Superior, and the " Dawson Route" west of that lake, 1872 ; wet rocks, islands in Lake Nepigon, 1884 ; on rocks, Nanaimo River and Mount Benson, Vancouver Island, 1887. (*Macoun.*) On rocks in the country from York Factory to the Rocky Mountains. (*Drummond.*) Kobbfjerd, Greenland. (*Fl. Gr.*)

(64.) **C. virens,** Schimp. ; Lesq. & James, Mosses of N. America, 61 ; Canadian Musci No. 22.

Dicranum virens, Hedw. ; Drumm. Musc. Bor.-Am. No. 106.

West Greenland and Smith's Sound. (*Dr. Kane.*) Jakobshavn,

Greenland. (*R. Brown.*) On rocks Hudson Strait, 1885. (*Dr. Bell.*) Abundant on wet rocks at Kicking Horse Lake, Rocky Mountains, 1885 ; on wet rocks at Pass Creek, near Sproat, Columbia River, B.C. (*Macoun.*) On Mount Queest, Gold Range, B.C., alt. 6,000 feet, 1889. (*J. M. Macoun.*) Smith's Sound. (*Dr. Kane.*) Disco Island, Greenland. (*Fl. Gr.*)

Var. **serratum,** Bruch & Schimp. ; Canadian Musci No. 488.

On wet gravel by brooks, chiefly in mountains. Ravine on the side of Mount Albert, Gaspé Co., Que. (*J. A. Allen.*) Salt Lake, Anticosti, 1883 ; Ste. Anne des Monts River, Gaspé, Que., 1882 ; on rocks Eagle River, at Craigellachie, also on Mount Queest, Gold Range, 1889, and along the Blackwater River, 1875 ; between the North Thompson and Bonaparte Rivers, B.C., 1889; on rocks near Victoria, Vancouver Island, 1875 ; along a brook summit of North Mountain at Hector, Rocky Mountains, and on stones in a brook above Revelstoke, B.C. (*Macoun.*) Smith's Sound. (*Dr. Kane.*)

(65.) **C. Wahlenbergii,** (Brid.) ; Canadian Musci No. 23.

C virens, Schimp. var. *Wahlenbergii,* Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 61.

Dicranum Richardsoni, (n. sp.) Drumm. Musc. Bor.-Am. No. 104.

West Greenland and Smith's Sound. (*Dr. Kane.*) On fallen trees Bass River, Kent Co., N.B. (*Fowler.*) Tobique River, N.B. (*Hay.*) Generally on decayed trees ; in the country extending from Canada to the Rocky Mountains (104). (*Drummond.*) Vicinity of Quebec. (*St. Cyr.*) In bogs, Salt Lake, Anticsoti, 1883 ; decayed wood at Truro, N.S., 1883 ; on logs, coast of Gaspé, Que., 1882 ; on dead and decaying logs at Leamy's Lake, near Hull, Que., 1889 ; Sudbury Junction (1884), and in woods at Belleville, Ont., 1867 ; on decaying logs Winnipegoosis, Man., 1881. (*Macoun.*) On old logs in woods, Newfoundland. (*Rev. A. Waghorne.*) Smith's Sound. (*Dr. Kane.*) Disco Island, Greenland. (*Fl. Gr.*)

Var. **compactum,** (Schimp).

D. microcarpum, (n. sp.) Drumm. Musc. Bor.-Am. No. 105.

On moist barren spots ; near the Rocky Mountains (105). (*Drummond.*) On old logs at Gananoque, Ont. (*Fowler.*) Peat bog, Salt Lake, Anticosti. (*Macoun.*) On the coast of Labrador at Forteau Bay ; also on exposed rocks on the higher part of Table-top Mountain, Gaspé Co., Que. (*J. A. Allen.*)

16. DICHODONTIUM, Schimp.

(66.) **D. pellucidum,** Schimp.; Lesq. & James, Mosses of N. America, 62; Canadian Musci No. 451.

On earth, Queen's Co., N.B. (*Moser.*) On earth along Hunter's River, Prince Edward Island, 1888; on wet rock, Madeline River, Gaspé, Que., 1882; on stones in Sydenham River, Owen Sound, Ont.; on stones in Eagle River at Griffin's Lake, Gold Range, B.C., 1889; on stones in brooks at Revelstoke, B.C., 1890; on stones at Goldstream, Vancouver Island, 1887; on stones in a brook, eastward in Roger's Pass, Selkirk Mountains, and at Hector, Rocky Mountains. (*Macoun*). Disco Island. (*Fl. Gr.*)

Var. **fagimontanum,** Braithw. British moss-flora 163.

In mud by a brook at Hector, Rocky Mountains, Aug. 14th, 1890, (*Macoun.*)

(67.) **D. flavescens,** Lindb. in Botan. notiser 1878, p. 113; Canadian Musci No. 402.

D. pellucidum, Schimp. var. *serratum,* Schimp.; Lesq. & James, Mosses of N. America, 62.

Mount Albert, Gaspé Co., Que., and at Forteau, Labrador, lat. 57°. (*J. A. Allen.*) Blackwater River, northern British Columbia, 1875; wet cuttings along the C. P. Railway, east of Hastings, and at Yale, B.C., 1889; wet slopes of Mount Arrowsmith, Vancouver Island, 1887; on stones and wet rocks along the Columbia, one mile above Revelstoke, B.C., 1890. (*Macoun.*)

17. TREMATODON, Michx.

(68.) **T. ambiguum,** Hornsch.; Lesq. & James, Mosses of N. America, 63; Canadian Musci No. 24.

On earth, chiefly along roadsides. Topsail Harbor, Newfoundland. (*Rev. A. Waghorne.*) Pictou, and Halifax Co., N.S. (*McKay.*) Miquelon Island. (*Delàmare.*) Tay, York Co.; and Never's Rapids, Queen's Co., N.B. (*J. Moser.*) Tobique River, N.B. (*Hay.*) Bass River, Kent Co., N.B. (*Fowler.*) Clay banks of Black River, Prince Edward Island, 1888; roadsides, Truro, N.S., 1883; on earth near Flinton, North Hastings, and at Owen Sound, Ont., 1871; border of a bog, Craigellachie, Eagle River, B.C., 1889. (*Macoun.*)

(69.) **T. brevicollis,** Hornsch. ; Bryol. Europ. I. tab. 95.

Greenland. (*Fl. Gr.*)

18. ÅNCSTRŒMIA, Bruch & Schimp.

(70.) **Å. longipes,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 63 ; Canadian Musci No. 25.

Dicranum julaceum, Drumm. Musc. Bor.-Am. No. 100.
Dicranum varium, Drumm. Musc. Bor.-Am. No. 99, in part.

Banks of Portage River, near the Columbia River, Rocky Mountains. (*Drummond.*) Alluvium along Six Mile Creek (1885) and along the discharge of the Asulcan Glacier, Selkirk Mountains, B.C., 1890. (*Macoun.*) Greenland. (*Fl. Gr.*)

19. DICRANELLA, Schimp.

(71.) **D. crispa,** Schimp. ; Lesq. & James, Mosses of N. America, 64 ; Canadian Musci, No. 504.

Dicranum crispum, Drumm. Musc. Bor.-Am. 101.

Banks of Baptiste River, and near the "Height of Land," Rocky Mountains. (*Drummond.*) Galton Mountains, B.C. (*Lyall.*) On earth at McLeod's Lake, lat. 55°, 1875 ; on damp earth on stumps and banks Six Mile Creek, (1885) and Roger's Pass, Selkirk Mountains, B.C., 1890. (*Macoun.*) Kotzebue Sound. (*Roth. Alask.*) Christianshaab, Greenland. (*Fl. Gr.*)

(72.) **D. Grevilleana,** Schimp. ; Lesq. & James, Mosses of N. America, 64 ; Canadian Musci, No. 482.

Dicranum Schreberianum, Drumm. Musc. Bor.-Am. No. 97.

Banks in alpine situations ; and about York Factory, Hudson Bay. (*Drummond.*) On wet earth along Jupiter River, Anticosti, 1883 ; wet gravelly soil and damp earth at Hector, Rocky Mountains, 1890 ; Six Mile Creek and Roger's Pass, Selkirk Mountains, B.C., 1885. (*Macoun.*)

(73.) **D. Schreberi,** Schimp. ; Lesq. & James, Mosses of N. America, 64 ; Canadian Musci, No. 403.

D. Schreberi, var. *occidentalis* ; Canadian Musci No. 495.
Dicranum Schreberianum, Drumm. Musc. Bor.-Am. 97.

Banks in alpine situations ; and about York Factory, Hudson Bay.

(*Drummond.*) On earth and stones in a brook near Trenton, and on damp earth by roadsides at Owen Sound, Ont., 1871; wet earth along Lesser Slave Lake, 1872; on wet earth at Quesnel, B.C., 1875; in limestone springs at Sicamous, B.C., 1889; and at Hector, Rocky Mountains, 1890. (*Macoun.*) Summit of Mount Queest, Gold Range, B.C., alt. 7,000 feet. (*J. M. Macoun.*)

(74.) **D. squarrosa,** Schimp.; Lesq. & James, Mosses of N. America, 65.

In peat bogs, Salt Lake, Anticosti; wet gravelly soil along the C. P. Railway in Roger's Pass, Selkirk Mountains, 1890. (*Macoun.*) Queen's Co., N.B. (*J. Moser.*) Alaska. (*Harrington.*) Lyngemarken and Egedesminde, Greenland. (*R. Brown.*)

(75.) **D. cerviculata,** Schimp.; Lesq. & James, Mosses of N. America, 65; Canadian Musci, No. 476.

Jakobshavn, Greenland. (*R. Brown.*) Miquelon Island. (*Delàmare.*) On damp earth, Carleton Co., N.B. (*Fowler.*) On wet earth at Brackley Point and Black River, Prince Edward Island, 1888; abundant on earth by a glacier stream where it enters Bear Creek, and along an old road Roger's Pass, Selkirk Mountains. (*Macoun.*) On rotten wood, St. John, N.B. (*Fowler's Cat.*)

(76.) **D. varia,** Schimp.; Lesq. & James, Mosses of N. America, 65; Canadian Musci, No. 26.

Dicranum varium, Drumm. Musc. Bor.-Am. No. 99, in part.

On clay at Truro, N.S. (*Fowler's Cat.*) On earth, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Wet ground, chiefly by the sides of ditches. Springy places at Truro, N.S., 1883; along old roads, Gaspé Co., Que., 1882; sides of ditches Experimental Farm, Ottawa; overflowed ground, Leamy's Lake, near Hull, Que.; common at Belleville, Wooler and Owen Sound, Ont.; Lesser Slave Lake and Fort Assiniboine on the Athabasca River, 1872. (*Macoun.*) Banks of rivers; in the country extending from York Factory to Rocky Mountains. (*Drummond.*) On wet clay banks, London, Ont. (*J. Dearness.*)

(77.) **D. parvula,** Kindb.; Bull. Torr. Bot. Club, April, 1889.

Allied to *D. varia.* Plants very short, densely cæspitose in small tufts, dark green. Leaves crenulate all around, sub-ovate; cells short, oblong-quadrate, the basal linear; costa very thick and brown, excur-

rent, denticulate above, forming at least half the acumen. Perichetial leaves denticulate above. Capsule obovate, sub-erect or inclined without a neck, not striate; beak very short and thick; annulus scarcely loosed; teeth orange, pale at apex, partite, without basilar membrane, not papillose; pedicel pale red-yellow 1 c. m. long or shorter, straight or curved only at apex. Dicœcious.

On earth, on the northern slope of Cathedral Mountain, Kicking Horse River, Rocky Mountains, B.C. Alt. 6,500 feet. July 28th, 1885. (*Macoun.*)

(78.) **D. rufescens,** Schimp.; Lesq. & James, Mosses of N. America, 66; Canadian Musci, No. 27.

On earth, Bass River, Kent Co., N.B. (*Fowler.*) Canaan Forks, Queen's Co., N.B. (*J. Moser.*) By roadsides, on wet earth, at Brackley Point and Black River, Prince Edward Island, 1888; in cuttings along the C. P. Railway, east of Hastings, and by a brook at Yale, B.C.; common on wet earth at Owen Sound, Ont., 1874. (*Macoun.*)

(79.) **D. subulata,** Schimp.; Lesq. & James, Mosses of N. America, 66; Canadian Musci, No. 28.

Dicranum subulatum, Drumm. Musc. Bor.-Am. No. 98.

Disco, Greenland. (*Fl. Gr.*) Kouchibouguac, N.B. (*Fowler's Cat.*) Tay, York Co., N.B. (*J. Moser.*) On old roads along the Gaspé Coast, Que., 1882; on earth, Salmon River, near Fort McLeod, B.C., 1875; very abundant along the C. P. Railway at Hector, Rocky Mountains; along Bear Creek in Roger's Pass, and at the Asoulcan Glacier, Selkirk Mountains, B.C., 1890. (*Macoun.*) Banks in alpine situations. (*Drummond.*)

(80.) **D. heteromalla,** Schimp.; Lesq. & James, Mosses of N. America, 66; Canadian Musci, No. 29.

Dicranum heteromallum, Drumm. Musc. Bor.-Am. No. 95.
" " var. *caulibus foliisque longioribus,* Drumm. Musc. Bor.-Am. No. 96.

Near the Columbia (No. 95); Upper Canada (No. 96). (*Drummond.*) Miquelon Island. (*Delàmare.*) Common in Nova Scotia. (*McKay.*) On clay banks at Pirate's Cove, Yarmouth, and Truro, N.S., 1883; on earth Rustico Bay, Prince Edward Island, 1888; on the summit of Mount Albert, and at Gaspé Basin, Gaspé Co., Que., 1882; common

in woods at Ottawa, Carleton Place, Sudbury Junction, Collingwood Owen Sound, Belleville and Brighton, Ont.; Comox, Vancouver Island; on turned up trees at Hastings and in wet cuttings along the C. P. Railway east of Hastings, B.C. (*Macoun.*) On earth at London, Ont. (*J. Dearness.*) On earth at Topsail Harbor, Newfoundland. (*Rev. A. Waghorne.*) Moist ground; common, N.B. (*Fowler's Cat.*) On earth, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Alaska. (*Roth. Alask.*)

20. DICRANUM, Hedw.

(81.) **D. hyperboreum,** (Gunn.) Smith; Greenland Flora, 386.

Disco, Greenland. (*Fl. Gr.*)

(82.) **D. fulvellum,** Smith; Lesq. & James, Mosses of N. America, 68.

Greenland. (*Fl. Gr.*)

(83.) **D. molle,** Wils.; Braithw. British Moss Flora, 144.

D. arcticum, Schimp. Bryol. Europ. ed. 2, 93.

Tufts large, dense 6-15 cm. high, yellow-green or olivaceous above, fuscescent below. Stem eradiculose. Leaves erecto-patent, straight, glossy, oblong-lanceolate, nearly entire; cells narrow-linear, the angular quadrate, orange; costa narrow, vanishing at the apex. Capsule oblong-cylindric, cernuous incurved substrumose not striate, fuscescent; annulus simple; lid short-beaked; peristome purple. Monœcious; male inflorescense close to the perichætium.

Allied to *D. Starkii*, but the capsule is greater, and the costa not excurrent. Greenland. (*Fl. Gr.*)

(84.) **D. Starkii,** Web. & Mohr.; Lesq. & James, Mosses of N. America, 68; Canadian Musci, No. 30; Drumm. Musc. Bor.-Am. No. 83.

Rocks upon the "Height of Land," Rocky Mountains. (*Drummond.*) On wet rocks, Mount Albert, Gaspé Co., Que.; on the faces of perpendicular rocks Mount Benson, Mount Arrowsmith and Mount Mark, Vancouver Island, 1887; on flat rocks, mountains north of Griffin Lake in the Gold Range, also on rocks at the Asulcan Glacier, Selkirk Mountains, B.C. (*Macoun.*) Smith's Sound. (*Dr. Kane.*)

(85.) **D. Blyttii,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 68; Canadian Musci, No. 32.

In a peat bog at Salt Lake, Anticosti, 1883; damp rocks, Mount Benson, Vancouver Island, 1887; on rocks at the "Hot Springs," Kootanie Lake, B.C.; alt. 4,500 feet, and at the Asulcan Glacier, Selkirk Mountains. (*Macoun.*) Upernivik, Greenland. (*Fl. Gr.*)

(86.) **D. strictum,** Schleich.; Lesq. & James, Mosses of N. America, 69; Canadian Musci, No. 33.

D. elongatum, var *minor*, Drumm. Mus. Bor.-Am., No. 81.

Quite common on decaying logs, especially westward. Decayed trunks, Lake Superior, 1848. (*Agassiz.*) Porcupine Mountains, Man., 1881; St. John's, Peace River, and Lesser Slave Lake, N.W.T., 1872; Comox, Cedar Hill and Nanaimo, Vancouver Island, 1887; at Sicamous, Yale, Hastings, Agassiz and North Arm of Burrard Inlet, B.C., 1889; on bases of trees at Revelstoke, and rotten wood at Deer Park, Lower Arrow Lake, Columbia River, B.C., 1890. (*Macoun.*) Decayed trunks, Tobique River, N.B. (*Hay.*) On decayed wood, rare. (*Drummond.*)

(87.) **D. montanum,** Hedw.; Lesq. & James, Mosses of N. America, 69; Canadian Musci, No. 34.

Abundant on decaying trunks and bases of standing trees, eastward. On trees in woods, Newfoundland. (*Rev. A. Waghorne.*) Pictou Co., N.S. (*McKay.*) Tay, York Co.; also Canaan Forks, N.B. (*J. Moser.*, Miquelon Island. (*Delàmare.*) On logs, Tobique River, N.B. (*Hay.*) Rotten wood, Bass River, and Fredericton, N.B. (*Fowler.*) Old logs, Rustico Bay and Hunter's River, Prince Edward Island, 1888; in woods, Gaspé Co., Que., and at Leamy's Lake, near Hull, Que.; on bases of trees at Belleville, Sudbury Junction and near Otter Head, Lake Superior; shore of Lake Huron near Wiarton and Nepigon House, Lake Nepigon, Ont.; on old logs, Manitoba House, Lake Manitoba, 1881. (*Macoun.*)

(88.) **D. fulvum,** Hook; Lesq. & James, Mosses of N. America, 70; Canadian Musci, No. 37.

On boulders, chiefly in damp woods. Tay, York Co., N.B. (*J. Moser.*) On rocks, Tobique River, N.B. (*Hay.*) Halifax Co., N.S. (*McKay.*) On rocks in woods at Sudbury Junction, Ottawa, Belleville and Wooler, Ont. (*Macoun.*) On rocks, Rivière Rouge, Argenteuil Co., Que. (*D'Urban.*)

(89.) **D. viride,** Schimp.; Lesq. & James, Mosses of N. America, 69; Canadian Musci, No. 35.

Quite common, but always barren, on the bases of growing trees and old lying logs in woods. Green Harbour, Newfoundland. (*Rev. A. Waghorne.*) On trees, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On trees, Rustico Bay, Prince Edward Island, 1888; very common at Ottawa, Belleville, Owen Sound and throughout Ontario; near Morley in the Rocky Mountains, 1885. (*Macoun.*) Common in pulvinate buttons on trees, Nixon's Pond, London, Ont. (*J. Dearness.*)

(90.) **D. flagellare,** Hedw.; Lesq. & James, Mosses of N. America, 70; Canadian Musci, No. 36.

D. strictum, Drumm. Musc. Bor.-Am. No. 81.

Very common on decaying logs in damp woods. On fallen timber about Lake Superior, &c. (*Drummond.*) On decaying logs, St. John, N.B. (*Fowler's Cat.*) Tay, York Co.; and Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Quite common at Sudbury Junction, Ottawa, Belleville, Wooler and throughout Ontario; on logs, Manitoba House, Lake Manitoba; Lesser Slave Lake, N.W.T.; and Quesnel, B.C., 1875. (*Macoun.*) On logs near London, Ont. (*J. Dearness.*)

(91.) **D. Miquelonense,** Ren. & Card., Coulter's Bot. Gaz. Vol. XIV., 93.

In small, compact, yellowish-green tufts. Stems dichotomous, radiculose below, 1–3 cm. long. Leaves small, short, erect-imbricate or slightly incurved, oblong-lanceolate, acute or obtuse concave, entire or minutely sinuate-denticulate at apex, 2–3 mm. long, .50–.75 mm. broad; costa vanishing near the apex, smooth or scarcely rugose at back. Cells of the areolation smooth, small, short, quadrate or irregularly angular in the upper half, rectangular, 1-3 times longer than broad, thin-walled toward the base, the alar lax, large, quadrate or sub-hexagonal, brown or yellowish. Fruit unknown.

Rather resembling in habit the stunted forms of *D. elongatum,* Schw., and *D. Grœnlandicum,* Brid., but quite distinct by the form and areolation of the leaves. It has also some affinities with *D. flagellare,* Hedw.

On ground and rock, Miquelon Island, Gulf of St. Lawrence, (*Delàmare.*)

(92.) **D Grœnlandicum,** Brid.

D. tenuinerve, Zett.; Coulter's Bot. Gaz. Vol. XIV. 99.
D. Labradoricum, C. Muell.

Miquelon Island. (*Delàmare.*) Mansfield Island, Hudson Strait. (*R. Bell.*) In bogs, Jupiter River, Anticosti. (*Macoun.*) Labrador and Greenland. (*Kindb.*)

(93.) **D. subulifolium,** Kindb., Bull. Tor. Bot. Club, Vol. XVII., 87.

Stems low, 2–3 cm. high, not or sparingly radiculose. Leaves yellowish, patent, scarcely brittle, very narrow and subsetaceous, the subula denticulate above ; cells narrow porose ; costa about one-sixth of the leaf near the base, smooth at the back, often excurrent. Capsule small straight (?) and cylindric ; seta yellow.

Allied to *D. angustifolium*, Kindb. ; differs in the shorter, more crispate and green leaves, the costa more distinct and broader, about one-sixth of the leaf near the base. The capsules are probably straight but are not ripe in our specimens.

On logs in woods at Cedar Hill, near Victoria, Vancouver Island, 1887 ; also on logs near Lesser Slave Lake, and at St. John's on Peace River, 1872. (*Macoun.*)

(94.) **D. angustifolium,** Kindb., Bull. Torr. Bot. Club, Vol. XVII. 86 ; Canadian Musci, No. 409.

Stem about 5 cm. high, radiculose. Leaves shining subuliform, not undulate, very narrow, 1·5 cm. long, denticulate to $\frac{1}{3}$ or from the middle upward, not crispate, brittle, straight or patent ; cells very porose and narrow ; outer alar cells brown, inner hyaline ; costa smooth at the back, faint and very narrow (about $\frac{1}{10}$ of the leaf near the base) scarcely excurrent.

Allied to *D. subulifolium*, Kindb., but differing in the longer leaves, longer leaf cells and doubly narrower, not excurrent costa. Habit of *D. sulcatum ;* differing in the leaves bright green or golden glossy, more distinctly denticulate, 1 cm. long ; the cells narrow, the costa scarcely excurrent, faint and very narrow, about $\frac{1}{10}$ of the leaf near the base ; the capsule nearly smooth ; the peristome brown.

Abundant on damp rocks on the North Arm of Burrard Inlet, and at Craigellachie on Eagle River, B.C., 1889 ; on damp rocks near Victoria, Vancouver Island. (*Macoun.*)

(95.) **D. sulcatum,** Kindb. Bull. Torr. Bot. Club, Vol. XVII. 87 ; Canadian Musci, No. 406.

Dicœcious. Stem very tomentose, about 5 cm. high. Leaves green, usually slightly twisted, not undulate, 1-1.5 cm. long, narrow ovate-lanceolate, gradually narrowed into a long setaceous faintly denticulate point, more or less brittle ; cells porose, the lower long, the upper short ; costa long-excurrent, smooth, broad, $\frac{1}{5}$ of the leaf near the

base. Capsule curved, furrowed when dry, substrumose; peristome dark red; seta 2 cm. long, solitary.

This species could be considered as allied to *D. strictum*, Schleich., and *D. viride*, Schimp., but differs principally in the form of the capsule and in the less brittle leaves; the costa is narrower than in *D. viride*. It has also affinity to *D. majus*, Turn.

On the ground and on logs at Victoria, Vancouver Island, 1885; on the ground in woods at Hastings, and at Agassiz and Sicamous, B.C., 1889. (*Macoun.*)

(96.) **D. crispulum,** C. M. & Kindb. (n. sp.); Canadian Musci, No. 41, in part.

Nearly allied to *D. sulcatum*, Kindb., but differing in having a shorter stem, 2–3 cm. high, the leaves crispate, very much shorter, 0·5—0·8 cm. long, the costa less excurrent, rough at the back, the alar cells smaller.

On logs in woods at Comox, Vancouver Island, May 2nd, 1887; on logs in woods Albert Cañon, Illicillewaet River, B.C., May, 1890. (*Macoun.*)

(97.) **D. leioneuron,** Kindb., Bull. Torr. Bot. Club, Vol. XVI. 92; Canadian Musci, No. 44, in part, barren specimens.

Dicœcious. Plants loosely tufted, about 9 cm. high, pale-yellowish. Stem, tall sparingly radiculose. Leaves suberect, involute nearly all around, not undulate, ovate-lanceolate, narrowed into a short obtusate or subacute acumen, nearly entire or with a few small teeth at the apex; cells not porose, narrow except the basilar; alar cells brown, median basal cells hyaline, inner yellow near the costa; costa smooth and faint, ceasing below the acumen, $\frac{1}{10}$ of the leaf near the base. Barren.

This species has no affinity to the other Canadian *Dicrana* and is very distinct in the long-celled, nearly entire leaves and the costa narrow. In habit it may be compared with some forms of *D. scoparium*, Hedw.

In swampy woods at Salt Lake, Anticosti, August 12th, 1883. (*Macoun.*)

(98.) **D. majus,** Turn.; Lesq. & James, Mosses of N. America, 74; Canadian Musci, No. 44, in part, fertile.

Deep cool woods, on the ground. Miquelon Island. (*Delàmare.*) Riviere du Loup (*en bas*). (*St. Cyr.*) On earth at Brackley Point,

P.E.I., 1888; in woods, McNab's Island, Halifax Harbor, N.S., 1883; Fox River, Gaspé Co., Que., 1882; Jupiter River, Anticosti; thick woods at Wooler, Ont., 1888; and on logs in woods near Victoria, Vancouver Island, 1875. (*Macoun.*) Sitka. (*Roth. Alask.*)

(99.) **D. scoparium,** Hedw.; Lesq. & James, Mosses of N. America, 73; Canadian Musci, No. 42; Drumm. Musc. Bor.-Am. No. 80.

Very common on earth and logs throughout Canada. Common throughout the country. (*Drummond.*) Woods near St. Johns, Newfoundland. (*Rev. A. Waghorne.*) Common in N. B. Different forms or varieties occur. (*Fowler's Cat.*) Tay, York Co., and Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Miquelon Island. (*Delàmare.*) Kotzebue Sound and Alaska. (*Roth. Alask.*) Baffin's Bay. (*Ross. Voy.*) Smith's Sound. (*Dr. Kane.*) Greenland. (*Fl. Gr.*) Roots of trees Lancaster Beach and Tobique River, N.B. (*Hay.*) Nain, coast of Labrador, 1885. (*R. Bell.*) Common in Nova Scotia. (*McKay.*) Riviere du Loup (*en bas*) Que. (*St. Cyr.*) Rustico Bay and Brackley Point, P.E.I.; Pirate's Cove, Straits of Canso, N.S.; Jupiter River, Anticosti; Mount Albert and Fox River, Gaspé Co., Que.; Ottawa, Carleton Place, North Bay, Lake Nipissing, Belleville, Wooler, Owen Sound, shore of Lake Nepigon, Ont.; also Cedar Hill near Victoria, Vancouver Island. (*Macoun.*) Common at London, and Point Edward, Ont. (*J. Dearness.*)

Var. **scopariiforme,** Kindb., Bull. Torr. Bot. Club, Vol. XVI., 92; Canadian Musci, No. 43.

Intermediate between *D. scoparium,* Hedw. and *D. fuscescens* Turn. Dicœcious. Leaves greenish-yellow, flexuous, lanceolate, subulate with a short and flat subula; margin nearly flat or slightly incurved, densely and sharply serrate to one-third; cell-walls rarely interrupted by pores; upper cells oblong-oval, lower not much narrower, inner basal light brown; costa thick, percurrent, with two serrate ridges at the back in the upper part. Capsule curved, not striate; pedicel red, short.

On earth and logs in woods. Bass River, Kent Co., N.B. (*Prof. Fowler.*) The dark colored form at Canaan Forks, N.B. (*J. Moser.*) A dark colored form (*nigrescens,* Kindb.) at Rustico Bay, P.E.I.; Pirate's Cove, Straits of Canso, N.S.; McKay's woods, Ottawa; abundant near Wooler, and at Belleville, Ont.; west of Edmonton, and along Buffalo Lake north of Isle à la Crosse, N.W.T., 1875; in woods at Revelstoke, B.C., 1890. (*Macoun.*) Roots of trees Island Lake, Argenteuil Co., Que. (*D'Urban.*) Bottom of cañon below Elk River Bridge, Rocky Mountains. (*Dr. Dawson.*)

Var. **pallidum,** C. Muell.

Miquelon Island. (*Delàmare.*)

(100.) **D. congestiforme,** C. M. & Kindb. (n. sp.)

Differs from *D. congestum*, Brid., in the leaves being less twisted, the upper cells oblong, the costa narrow, the perichetial leaves long-acuminate, the capsule without annulus. Habit of *D. scoparium*, Hedw., but differing principally in the smooth costa, less denticulate leaves and the furrowed capsule. *D. rhabdocarpum* has all leaf-cells narrow.

On damp rocks on the east side of Lake Mara at Sicamous, B.C., July 3rd, 1889. (*Macoun.*)

(101.) **D. congestum,** Brid.; Musc. Recent. Suppl. I., 176; Canadian Musci, No. 408.

D. fuscescens, Lesq. & James, Mosses of N. America, 72, in part.

Differs from *D. fuscescens*, Turn. in the leaves being remotely serrate only above, the upper cells greater, nearly smooth and irregular, the lower porose, the costa narrower, $\frac{1}{7}$ width of the base, and the capsule quite smooth. (*Kindberg.*) Bogs, Mount Albert, Gaspé, 1882. On old logs in woods at Morley, Rocky Mountains, 1885; at Donald in the Columbia Valley, 1889. (*Macoun.*) Sitka. (*Roth. Alask.*) Christianshaab, Greenland. (*Fl. Gr.*)

(102.) **D. fuscescens,** Turn.; Lesq. & James, Mosses of North America, 72, in part; Canadian Musci, No. 39.

Quite common on old logs across the continent. Tay, York Co., and Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Miquelon Island. (*Delàmare.*) On logs, Tobique River, N.B. (*Hay.*) On old logs, Bass River, Kent Co., N.B. (*Fowler's Cat.*) On logs, Jupiter River and Becscie River, Anticosti; in woods, Rustico Bay, P.E.I.; Pirate's Cove, Straits of Canso, N.S.; Fox River, Gaspé Co., Que.; on logs, at Ottawa, Belleville, Brighton, North Bay, Lake Nipissing, and Gull River, Peterboro Co., Ont.; on rocks, Lake Superior; old logs, Manitoba House, Lake Manitoba; on earth, Kicking Horse Lake, Rocky Mountains; on rocks at Sicamous, B.C.; Cameron Lake, Vancouver Island. (*Macoun.*) On old logs, Newfoundland. (*Rev. A. Wag-*

horne.) Along the Athabasca River, N.W.T. (*J. M. Macoun.*) Greenland. (*Fl. Gr.*)

Var. **brevirostre,** Kindb.

Belleville, Ont. ; and Macleod's Lake, B.C. (*Macoun.*)

(103.) **D. Muehlenbeckii,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 72; Canadian Musci, No. 481.

On Laurentian rocks at Shannonville, near Belleville, Ont., 1865 ; on earth at Morley, and on rocks at Hector, Rocky Mountains ; on logs, Roger's Pass, Selkirk Mountains, 1885; on earth at Câche Creek, and Blackwater River, B.C., 1875. (*Macoun.*) On the slopes of Mount Queest, Gold Range, B.C., alt., 5,000 feet, 1889. (*J. M. Macoun.*) On old logs, Craigellachie, 1889; woods between St. John and Dunvegan, Peace River, 1872. (*Macoun.*) Smith's Sound. (*Dr. Kane.*)

(104.) **D. brevifolium,** Lindb. Musci Scand., 24; Greenland Flora 392.

Godhavn, Greenland. (*Fl. Gr.*) Digges Island, Hudson Bay. (*R. Bell.*)

(105.) **D. Canadense,** Kindb., Bull. Torr. Bot. Club, Vol. XVII, 87

Size robust. Habit of *D. majus,* Turn., or *D. Drummondii.* Stem radiculose. Leaves indistinctly undulate, long-acuminate, denticulate at the acumen; inner basal cells hyaline, the alar orange, the other cells sublinear and porose ; costa smooth or slightly rough, not excurrent, broad at the base, narrow above. Capsule short, beaked, curved, finally costate and blackish.

Nearly allied to *D. subpalustre,* C.M. & Kindb., but the leaves are more gradually narrowed, also the perichetial ones, and very much longer; costa broader at the base.

On earth in woods at Moodyville, Burrard Inlet, B.C., April 19th, 1889. (*Macoun.*)

(106.) **D. leucobasis,** C. M. & Kindb. (n. sp.)

Dicœcious. Stem very tomentose, 3-4 cm. high. Leaves green, crispate or falcate, faintly sinuose-undulate, narrowly ovate-lanceolate, gradually tapering into a subuliform denticulate, often brittle, point ; alar cells fugitive, rectangular, small and yellow, the other lower cells

porose, elongate and hyaline, the upper short and chlorophyllose; costa scarcely excurrent, nearly smooth, narrow. Capsule curved, small and not furrowed; pedicel 1 cm. long.

This species is principally remarkable in the whitish leaf-base, but in habit resembling *D. congestum, Brid.*

On bases of trees in woods west of the Columbia River at Revelstoke, B.C., May 6th, 1890; and in Roger's Pass, Selkirk Mountains. (*Macoun.*)

(107.) **D. elongatum,** Schwaegr; Lesq. & James, Mosses of N. America, 71; Drumm. Musc. Bor.-Am., No. 91.

Mountain woods. (*Drummond.*) Miquelon Island. (*Delàmare.*) In bogs, New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Northern shores of Lake Superior, 1848. (*Agassiz.*) Mansfield Island, Hudson Strait. (*R. Bell.*) Mount Albert, Gaspé Co., Que.; borders of Lesser Slave Lake and near Peace River, 1872. (*Macoun.*) Kotzebue Sound. (*Roth. Alask.*) Smith's Sound. (*Dr. Kane.*) Greenland. (*Fl. Gr.*)

(108.) **D. plano-alare,** C. M. & Kindb. (n. sp.)

Differs from *D. Labradoricum,* C. Muell. (*D. Grœnlandicum,* Brid., Limpricht, *D. tenuinerve,* Zett.) in the leaf-cells being greater, short, rectangular and nearly uniform, the alar scarcely greater and not excavate; leaves green, a little larger with a quite blunt acumen; the stems cohering and shorter.

In *D. Labradoricum* the cells are very narrow, the alar well-defined and the leaves less blunt. The allied *D. elongatum* has an excurrent costa and the upper leaf-cells shorter than the lower.

On earth at the mouth of the Illicillewaet Cañon, near Revelstoke, B.C., May 18th, 1890. (*Macoun.*)

(109.) **D. fragilifolium,** Lindb.; Lesq. & James, Mosses of N. America, 73; Canadian Musci, No. 41.

On rotten wood, near Lesser Slave Lake, Sept. 20th, 1872; also on logs at Hudson Hope, Peace River. Lat. 55° 12′. 1872. (*Macoun.*)

(110.) **D. longifolium,** Hedw.; Lesq. & James, Mosses of N. America, 70; Canadian Musci, No. 38; Drumm. Musc. Bor.-Am. Nos. 93-94.

Greenland. (*Fl. Gr.*) Miquelon Island. (*Delàmare.*) On rocks at Sudbury Junction, and along the north shore of Lake Superior, and common at Lake Nepigon and along the Dawson Route west of Lake

Superior ; on rocks, Roger's Pass, Selkirk Mountains, B.C. (*Macoun.*) Crevices of rocks, Elk River, Rocky Mountains. (*Dawson.*) About Lake Superior (93), and at Great Bear Lake (94). (*Drummond.*)

(111.) **D. albicans,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 71 ; Canadian Musci, No. 404.

Crevices of rocks at the summit of the Gold Range, north of Griffin Lake, B.C., 1889, alt. 7,000 feet ; on rocks along the Asulcan Glacier, Selkirk Mountains, and on rocks by the railway three miles below Hector, and at Lake Agnes, Rocky Mountains, 1891. (*Macoun.*) Greenland. (*Fl. Gr.*)

(112.) **D. Bonjeani,** De Not. ; Braithw. Brit. Moss-Flora, 149.

D. palustre, Lesq. & James Mosses of N. America, 74 ; Canadian Musci No. 409.

In Dow's Swamp, near Ottawa ; "Big Swamp," Murray, and five miles north of Colborne, Northumberland Co., Ont. ; swamps, Porcupine Mountains, Man. ; wet rocks, North Arm, Burrard Inlet, B.C. ; and in wet woods at Victoria, Vancouver Island. (*Macoun.*) Peat bog at base of McKay's Mountain, Port Arthur. (*Mrs. E. G. Britton.*) Nulato and Sitka. (*Roth. Alask.*) Jakobshavn, Greenland. (*R. Brown.*)

***D. Columbiæ,** Kindb., Bull. Torr. Bot. Club, Vol. XVII., 86.

Cæspitose, tomentose and yellowish green. Leaves open-erect, undulate above, ovate-lanceolate, obtuse or short-acute, serrate at the back and on the borders above ; the uppermost cells oblong, the others linear, except the quadrate ones at the angles ; costa narrower, disappearing below the apex. Capsule solitary, narrow-cylindric, curved, striate, pale brown, not strumose, beak as long as the capsule ; pedicel yellow. Dicœcious.

Differs from the true *D. Bonjeani,* De Not. (*D. palustre,* Schimp.) principally in the leaves being blunt, serrate below the middle, the costa serrate also below the middle and the capsule without a neck.

Damp woods, by the borders of ponds, Cedar Hill, near Victoria, 1887 ; and on Campbell Hill, Cache Creek, B.C., alt. 2,500 feet, May 25th, 1875. (*Macoun.*)

(113.) **D. undulifolium,** C. M. & Kindb. (n. sp.)

Dicœcious. Plants robust ; branches thick. Stem sparingly, and only the base radiculose, (furnished with rhizoids) 3-4 cm. high. Leaves green or golden glossy, faintly undulate, loosely appressed, broad

ovate-lanceolate, nearly entire, acumen generally sub-obtuse ; alar cells brown, the others narrow and porose, the uppermost oblong ; costa not percurrent, smooth and narrow. Barren. Has often the habit of *Orthothecium chryseum*.

This species could be considered as intermediate between *D. scoparium* and *D. Bergeri*, but differs from both in its peculiar habit and the sparingly radiculose stem.

On earth near Fort Rupert, Vancouver Island, 1885. (*Dawson.*)

(114.) **D. subpalustre,** C. M. & Kindb. (n. sp.)

Differs from the allied *D. Bonjeani* in the leaves being more concave, suddenly narrowed into a long setiform acumen ; alar cells dark brown, forming distincter auricles ; the outer perichetial leaves long-aristate, the inner obtusate or very short-apiculate and entire. The leaves are faintly undulate and slightly crispate.

On earth on rocks at Hector, Rocky Mountains ; on rocks at Deer Park, Lower Arrow Lake, Columbia River, June 18th, 1890. (*Macoun.*)

(115.) **D. Bergeri,** Bland., Musc. fr. exs. III., No. 104 (1804).

D. Schraderi, Web. & Mohr. (1807); Lesq. & James, Mosses of N. America. 75 ; Canadian Musci, No. 45 ; Drumm. Musc. Bor.-Am., Nos. 87-88.

D.rugosum, Kindb. & var. *rugulosum*, Kindb., Ottawa Naturalist Vol. IV. 61,

Moist rocky places, not rare, especially about Norway House; (*Drummond.*) Wet woods, Bass River, N.B. (*Fowler's Cat.*) Peat bogs, Jupiter River and Salt Lake, Anticosti ; peat bog, Louisburg, Cape Breton ; cedar swamps, Hastings and Northumberland Co's., Ont. ; Porcupine Mountains, Man. ; mountain bogs, Lesser Slave Lake ; bogs at Stephen, summit of Rocky Mountains ; also in Roger's Pass, Selkirk Mountains. (*Macoun.*) Kotzebue Sound. (*Roth. Alask.*) Godhavn, Greenland. (*Fl. Gr.*) Miquelon Island. (*Delàmare.*) Peat bog near London, Ont. (*J. Dearness.*)

(116.) **D. Drummondi,** C. Muell. ; Lesq. & James, Mosses of N America, 76 ; Canadian Musci, No. 47.

D. Starkii, var. *major*, Drumm. Musc. Bor.-Am. No. 84.
D. undulatum, Turn., var., Drumm. Musc. Bor.-Am. No. 86.

Upper Canada in shady woods ; very common. (*Drummond.*) Damp woods, Brackley Point, P.E.I.; peat bogs, Sudbury Junction, Hastings Co., and Lake Nepigon, Ont. (*Macoun.*) Woods near London, Ont. (*J. Dearness.*)

Var. **trachyneuron,** Kindb. (n. var.)

Stems shorter. Leaves smaller, narrower and looser, more densely and evidently serrate on the borders, subuliform-cuspidate ; alar cells yellow ; costa not excurrent, rough also below the middle and upwards.

Cedar swamps at the base of the Oak Hills, Hastings Co., Ont., July 31st, 1871. (*Macoun.*)

(117.) **D. undulatum,** Turn. ; Lesq. & James, Mosses of N. America, 76 ; Canadian Musci, No. 48 ; Drumm. Musc. Bor.-Am. No. 85.

Miquelon Island. (*Delàmare.*) Dry woods, on the ground, Bass River, and Grand Lake, N.B. (*Fowler's Cat.*) Beau Lac, Madawaska, and swampy ground, Tobique River, N.B. (*Hay.*) Bogs, Tignish, P.E.I. ; common in McKay's Woods, Stewart's Bush, Dow's Swamp and Mer Bleue, Ottawa ; in cedar swamps throughout Ontario ; North Bay, Lake Nipissing, woods at Lake Nepigon ; swamps, Porcupine Mountains, Man. ; at Donald, Columbia Valley, and Deer Park, Lower Arrow Lake, Columbia River, B.C. ; and at Victoria, Vancouver Island. (*Macoun.*) In woods, Missinaibi River, Ont. (*R. Bell.*) Shady woods ; common. (*Drummond.*) Among *Sphagnum*, near London, Ont. (*J. Dearness.*) Nashwaaksis, York Co., N.B. (*J. Moser.*)

(118.) **D. spurium,** Hedw, ; Lesq. & James, Mosses of N. America, 75 ; Drumm. Musc. Bor.-Am. No. 90 ; Canadian Musci, No. 46 in part ; barren.

About Lake Superior. (*Drummond.*) On rocks, North West Arm, Halifax, N.S. ; on metamorphic rocks, Gatineau River at Chelsea, Que., and at Shannonville, Hastings Co., Ont., 1865. (*Macoun.*)

(119.) **D. brachycaulon,** Kindb. (n. sp.)

D. spurium, Canadian Musci, No. 46, in part.

Allied to *Dicranum spurium*, but differing in the short stem only 1 cm. high, the leaves smaller and shorter, oblong-ovate, acute, not acuminate, entire, not papillose at back, costa elevate, percurrent and smooth, alar cells brown, capsule small, pedicel 1 cm. long. This species is peculiar in its short leaves and the elevate costa.

On dry rocks in open woods near the lighthouse at Yarmouth, N.S., June 23rd, 1883. (*Macoun.*)

(120.) **D. dipteroneuron,** C. Muell., Beitr. zur Bryol. Nord-Amerikas in Flora 14. (1887.)

Alaska. (*C. Mueller.*)

21. MONOCRANUM, C. Muell.

(121.) **M. stenodictyon,** Kindb.

Dicranum stenodictyon, Kindb., Bull. Torr. Bot. Club, Vol. XVI. 92.

Plants densely tufted, about 2 cm. high, nearly eradiculose, blackish with straw-yellow tops, in color and habit resembling *Hypnum sarmentosum*. Leaves appressed when dry, not undulate nor crisped, when moist suberect, straight, nearly flat, from an oblong, below narrowed base, short-acuminate obtuse, crenulate, principally above the middle; cells thick-walled, not porose, the outer alar, subquadrate brown-yellow, the inner hyaline, the other cells lanceolate or the upper oblong, the apical sometimes oval; costa simply dentate at the back above, very narrow and only at the base dilated, vanishing in the acumen. Barren.

This peculiar species differs from our *Dicrana* principally in the crenulate not properly serrate leaves, which are also very short; it agrees nearly to *Monocranum dicranoides*, C. Muell., found near Valdivia, in Chili, having a peristome, differing from the dicranoid type in the teeth being entire, not cleft; the leaves are long-acuminate.

On earth in woods west of the Fraser River, on the Telegraph Trail at Quesnel, B.C., June 5th, 1875. (*Macoun.*)

22. DICRANODONTIUM, Bruch & Schimp.

(122.) **D. longirostre,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 77.

On rocks at Tay, York Co., N.B. (*J. Moser.*)

23. CAMPYLOPUS, Brid.

(123.) **C. Schimperi,** Milde.; Braithw. British Moss-Flora, 129.

Greenland. (*Fl. Gr.*)

TRIBE III. FISSIDENTEÆ.

24. FISSIDENS, Hedw.

(124.) **F. bryoides,** Hedw.; Lesq. & James, Mosses of N. America, 81; Canadian Musci, No. 49.

Dicranum bryoides, Drumm. Musc. Bor.-Am., No. 113.

Near Carlton House; and upon the Rocky Mountains. (*Drummond.*)

On earth at Ottawa, Ont.; on earth west of the Fraser River at the Blackwater Crossing (var. *Hedwigii*, Lamprecht.); on earth at Victoria, Vancouver Island, 1875 (var. *longipes*, Austin.). On earth at Revelstoke, near the Illcillewaet Cañon, B.C. (*Macoun.*)

(125.) **F. incurvus,** Schwaegr; Lesq. & James, Mosses of N. America, 82; Canadian Musci, No. 50, in part.

On earth in woods at Owen Sound, Ont.; on earth along a brook, near Victoria, Vancouver Island, 1875. (*Macoun.*) Greenland. (*Fl. Gr.*)

(126.) **F. tamarindifolius,** Don.; Canadian Musci, No. 410.

Abundant on earth at the roots of trees in woods at Leamy's Lake, near Ottawa; on earth at Owen Sound; in woods at Lac la Nun north-west of Edmonton, N.W.T.; and on the bases of trees by Eagle River at Sicamous, B.C. (*Macoun.*)

(127.) **F. limbatus,** Sulliv.; Lesq. & James, Mosses of N. America, 82.

On earth, by an old lumber road, at Comox, Vancouver Island, 1887. (*Macoun.*)

(128.) **F. minutulus,** Sulliv.; Lesq. & James, Mosses of N. America, 85.

Pictou, N.S. (*McKay.*) On stones in channels of small brooks in McKay's Woods, Ottawa; under the "Great Trenton Boulder," Trent valley, four miles above Trenton, and on boulders near Wooler, Ont.; on earth at Comox, Vancouver Island, 1887. (*Macoun.*)

(129.) **F. exiguus,** Sulliv.; Lesq. & James, Mosses of N. America, 84.

On stones in brooks west of Belleville, Ont., August 7th, 1867; on earth in woods at Revelstoke, west of the Columbia River, B.C., 1890. (*Macoun.*)

(130.) **F. pusillus,** Wils.; Braithw. British Moss Flora, 68.

F. incurvus, Canadian Musci, No. 50, in part.

Abundant on damp, flat, limestone rocks in woods at Beechwood and McKay's Lake, Ottawa, Ont. (*Macoun.*)

(131.) **F. osmundoides,** Hedw.; Lesq. & James, Mosses of N. America, 87; Canadian Musci, No. 51.

Dicranum osmundoides, Turn.; Drumm. Musc. Bor.-Am. No. 112.

Moist turfy situations, near the Rocky Mountains. (*Drummond.*) On peat, Salt Lake, and in woods, Jupiter River, Anticosti; Pirate's Cove, Straits of Canso, N.S.; on earth, Falls of Ste. Anne des Monts River, Gaspé, Co., Que.; roots of trees, Leamy's Lake and Dow's Swamp, Ottawa; Carleton Place, and near Belleville, Hastings Co., also near Peterboro, and at Owen Sound, Ont.; in damp woods at Nepigon; at Hector, Rocky Mountains, and at Sicamous, B.C., 1889. (*Macoun.*) Rough Waters, near Bathurst, N.B. (*Fowler's Cat.*) Greenland. (*Fl. Gr.*)

(132.) **F. adiantoides,** Hedw.; Lesq. & James, Mosses of N. America, 88; Canadian Musci, No. 52.

Dicranum adiantoides, Drumm. Musc. Bor.-Am., No. 110.

Near the Columbia River, and in Upper Canada. (*Drummond.*) On rocks, St. John N.B. (*Fowler's Cat.*) Near New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Wet rocks, Pictou, N.S. (*McKay.*) Moist places, Montcalm Co., Que. (*D'Urban.*) Boggy soil, Jupiter River, Anticosti; Pirate's Cove, Straits of Canso, N.S.; bases of trees at Sudbury Junction, Ont.; on wet earth, river bank, Comox, Vancouver Island, 1887. (*Macoun.*)

Var. **brachyphyllus,** Kindb. (n. var.) Leaves very short.

On boulders at Belleville, Ont., Oct. 13th, 1888. (*Macoun.*)

(133.) **F. decipiens,** De Not.; Lesq. & James, Mosses of N. America, 87; Canadian Musci, No. 400.

On rocks in the ravine at Whycocogmah, Cape Breton; bases of trees Gaspé Co., Que.; on earth in McKay's Woods, Dow's Swamp, and at Leamy's Lake, near Ottawa; on logs and old stumps, Hastings Co., and at Brighton, Northumberland Co., Ont.; on the bases of trees, Kakabeka Falls, Kaministiqua River, west of Lake Superior, 1869; on rocks at Owen Sound, Ont. (*Macoun.*)

(134.) **F. subbasilaris,** Hedw.; Lesq. & James, Mosses of N. America, 88.

Dicranum subbasilare, Drumm. Musc. Bor.-Am. No. 111.

On trunks of trees in Upper Canada. (*Drummond.*) On cedar trees in a swamp near London, Ont. (*J. Dearness.*)

(135.) **F. grandifrons,** Brid. ; Lesq. & James, Mosses of N. America, 89 ; Canadian Musci, No. 53.

Abundant below Niagara Falls. (*Lesq. & James.*) Very abundant in the Sydenham River, below Jones Falls, and in the Potawatamie River above and on its falls at Owen Sound ; in a spring at Banff, Alberta, 1891. (*Macoun.*) In Elk River, Rocky Mountains. (*Dawson.*)

25. CONOMITRIUM, Mont.

(136.) **C. Julianum,** Mont. ; Lesq. & James, Mosses of N. America, 89.

C. Hallianum, Canadian Musci, No. 54.

On stones in a running brook, Elziver Township, North Hastings, Ont., July 12th, 1878. (*Macoun.*)

TRIBE IV. LEUCOBRYEÆ.

26. LEUCOBRYUM, Hampe.

(137.) **L. vulgare,** Hampe. ; Lesq. & James, Mosses of N. America, 90 ; Canadian Musci, No. 55.

Dicranum glaucum, Drumm. Musc. Bor.-Am. No. 89.

Upper Canada. (*Drummond.*) Rocky places, Montcalm Co., Que. (*D'Urban.*) Not rare at Pictou, N.S. (*McKay.*) On earth at Brackley Point, P.E.I. ; damp woods, Straits of Canso, N.S. ; McKay's Woods, and Mer Bleue, near Ottawa ; on hummocks in swamps near Belleville, Hastings Co. ; at Wooler, Northumberland Co. ; above the Whirlpool, Niagara Falls, Ont. (*Macoun.*) In woods, Gananoque, Ont. (*Prof. Fowler.*) Tay, York Co., N.B. (*J. Moser.*) Green Harbor, Newfoundland. (*Rev. A. Waghorne.*) Miquelon Island. (*Delamare.*) Very abundant in woods at London, Ont. (*J. Dearness.*)

TRIBE V. CERATODONTEÆ.

27. CERATODON, Brid.

(138.) **C. purpureus,** Brid. ; Lesq. & James, Mosses of N. America, 92 ; Canadian Musci, No. 56.

Didymodon purpureum, Drumm. Musc. Bor.-Am. No. 116.

Common almost everywhere in burnt woods. (*Drummond.*) Very

common at Pictou, N.S. (*McKay.*) Near St. John, N.B. (*Hay.*) Abundant everywhere in New Brunswick. (*Fowler's Cat.*) River du Loup (*en bas*), Que. (*St Cyr.*) Abundant in all suitable localities from the Atlantic to the Pacific. It prefers roadsides, pastures, old walls, and roofs of houses and dry rocky ground. Collected by every person. (*Macoun.*) Apparently very common in Newfoundland. (*Rev. A. Waghorne.*) Shore of Buffalo Lake, N.W.T. (*J. M. Macoun.*) Kotzebue Sound, Sitka and Nulato. (*Roth. Alask.*) Jakobshavn, Greenland. (*R. Brown.*) Miquelon Island. (*Delàmare.*) Tay, York Co. and Canaan Forks, Queen's Co., N.B. (*J. Moser.*) A very common moss by roadsides at London, Ont. (*J. Dearness.*)

Var. **xanthopus,** Sulliv.; Lesq. & James, Mosses of N. America, 92.

On earth and rocks, Johnston's Strait, Gulf of Georgia. (*Dawson.*) Damp rocks near Cadboro Bay, Victoria, Vancouver Island. (*Macoun.*)

(139.) **C. conicus,** (Hampe.) Lindb.; Braithw. British Moss-Flora, 175.

Differs from *C. purpureus* in the long-excurrent costa, the capsule erect and symmetric, faintly sulcate, the lid shorter, the teeth pale, red at base, with fewer articulations. (*Kindberg.*)

On the base of a stump, on the extensive flat at the head of the ravine north of Mr. Murray's Ranche, Spence's Bridge, B.C., May 31st, 1889. (*Macoun.*)

(140.) **C. minor,** Aust.; Lesq. & James, Mosses of N. America, 92.

On damp earth along the Fraser River at Quesnel, B.C., 1875; Mount Tolmie, near Victoria, Vancouver Island, 1887. (*Macoun.*)

28. TRICHODON, Schimp.

(141.) **T. cylindricus,** Schimp.; Lesq. & James, Mosses of N. America, 93; Canadian Musci, No. 411.

Abundant on the borders of ditches at Hastings, B.C.; also at Craigellachie, Eagle Pass, and under the high tressle west of the Columbia at Revelstoke, B.C., 1890. (*Macoun.*)

29. DISTICHIUM, Bruch & Schimp.

(142.) **D. capillaceum,** Bruch & Schimp. . Lesq. & James, Mosses of N. America, 93; Canadian Musci, No. 57.

Didymodon capillaceum, Drumm. Musc. Bor.-Am., No. 122.
D. capillaceum var. *foliis brevioribus,* Drumm. Musc. Bor.-Am., No. 123.

Moist banks of rivers frequent, (122); upon "Limestone Rocks,"

about Lake Winnipeg (123). (*Drummond.*) Nottingham Island, Hudson Strait. (*R. Bell.*) Tattagouche Falls, N.B. (*Fowler's Cat.*) Long Rapids, Queen's Co., N.B. (*J. Moser.*) Kakabeka Falls, west of Lake Superior. (*Mrs. E. G. Britton.*) Very abundant in crevices of rocks and earth along the banks of all rocky forest streams throughout Canada. Jupiter River, Anticosti; Madaline River, Gaspé Co., Que.; Niagara Falls, Owen Sound, Port Stanley, Lake Nipissing, Lake Nepigon, and Lake Superior, Ont.; Lake Winnipegoosis, Man.; Fort Assiniboine, Athabasca River, N.W.T.; Morley, Banff, Silver City, and Hector, Rocky Mountains; Donald, Columbia Valley, and Roger's Pass, Selkirk Mountains; Revelstoke, Deer Park, and Sproat, Columbia River, B.C.; Mount Benson, Vancouver Island. (*Macoun.*) Mount Queest, Gold Range, B.C., and along the Clearwater River, lat. 57°, N.W.T. (*J. M. Macoun.*) Jakobshavn, Greenland. (*R. Brown.*) Kotzebue Sound and Nulato. (*Roth. Alask.*)

(143.) **D. inclinatum,** Bruch & Schimp.; Lesq. & James, Mosses of North America, 94; Canadian Musci, No. 58.

Didymodon inclinatum, Drumm. Musc. Bor.-Am., No. 124.

Dead Islands, Labrador. (*J. A. Allen.*) Peat bogs, Salt Lake and Jupiter River, Anticosti; St. Anne des Monts River, Gaspé Co., Que.; crevices of damp rocks, Lake Nepigon; north-east shore of Lake Superior, 25 miles above Michipicoten; on limestone rocks opposite Hudson Hope, Peace River, lat. 56°; wet banks, Morley, and crevices of rocks, Silver City and Hector, Rocky Mountains. (*Macoun.*) Moist alpine situations. (*Drummond.*) Greenland. (*Fl. Gr.*)

(144.) **D. Macounii,** C. M. & Kindb. (n. sp.); Canadian Musci, No. 490.

Tufts dusky green, radiculose below. Stem 2-3 cm. high. Leaves patent or subfalcate, from a short, suddenly narrowed, sheathing base, entire or with a few small teeth at the apex; cells short subquadrate; costa subpercurrent. Barren.

A very distinct and peculiar species; our other species have very much longer leaves with a long-excurrent costa.

In habit it is like *Leptotrichum flexicaule* var. *densum* growing in very close compact little tufts amongst other mosses on banks subject to inundation. Mouth of the Illicillewaet Cañon, and on left bank of the Columbia at a point of rocks one and a half miles above Revelstoke, B.C., May 18th, 1890. (*Macoun.*)

TRIBE VI. SELIGERIEÆ.

30. SELIGERIA, Bruch & Schimp.

(145.) **S. Donii,** (Sm.) C. Muell.; Braithw. British Moss Flora, 116.

Anodus Donianus, Bruch & Schimp.; Lesq. & James, Mosses of N. America, 96.

Gymnostomum pusillum, (n. sp.) Drumm. Musc. Bor.-Am., No. 22.

Sandstone rocks of Baptiste River, Rocky Mountains. (*Drummond.*) Under the surface of flat limestone rocks, Owen Sound, Ont. (*Macoun.*)

(146.) **S. pusilla,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 34; Canadian Musci, No. 59.

On limestone rocks, Gaspé Basin, Que.; under flat limestone rocks in woods north of Aylmer Road, a little beyond Hull, Que. (*Macoun.*) Kelly's Island, Lake Erie. (*Lesquereux.*)

(147.) **S. calcarea,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 97.

Weissia calcarea, Drumm. Musc. Bor.-Am., No. 65.

Limestone rocks of Lake Winnipeg. (*Drummond.*) Limestone rocks at Owen Sound, Ont., 1890. (*Macoun.*)

(148.) **S. recurvata,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 97; Canadian Musci, No. 60, in part.

Abundant on detached limestone rocks at Owen Sound, Ont.; dry cañon near Devil's Lake, Rocky Mountains. (*Macoun.*) Devil's Hole, Niagara, Ont. (*Mrs. Roy.*)

Var. **arcuata,** Lesq. & James, Mosses of N. America, 97.

Weissia Seligeri, Drumm. Musc. Bor.-Am., No. 66.

Sandstone rocks, near the Rocky Mountains. (*Drummond.*)

(149.) **S. campylopoda,** Kindb. (n. sp.) Canadian Musci, No. 60, in part.

Agrees with *Seligeria recurvata* in the shape of the capsule and the arcuate pedicel, but differs considerably in the leaves being broader, very much shorter, sublinear obtuse, rarely short-acuminate and subacute, and the costa not excurrent, the perichetial leaves ovate-oblong, thin-costate, the peristome darker red. The male flower is fixed on the side of the female.

On damp and shaded limestone rocks at Owen Sound, Ont., Sept. 16th, 1890. (*Macoun.*)

31. BLINDIA, Bruch & Schimp.

(150.) **B. acuta,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 98; Canadian Musci, No. 61.

Weissia acuta, Hedw.; Drumm. Musc. Bor.-Am., No. 72.

Rocks near the "Height of Land," Rocky Mountains. (*Drummond.*) New Harbor, Newfoundland. (*Rev. A. Waghorne.*) On rocks at Never's Rapids, Queen's Co., N.B. (*J. Moser.*) On damp rocks, Roger's Pass, Selkirk Mountains, B.C.; and along the Nanaimo River near its mouth, Vancouver Island. (*Macoun.*) Summit of Mount Queest, Gold Range, B.C. (*J. M. Macoun.*) Disco, Greenland. (*Fl. Gr.*)

32. CAMPYLOSTELEUM, Bruch & Schimp.

(151.) **C. saxicola,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 99.

On sandstone boulders, Hunter's River, Prince Edward Island, 1888. (*Macoun.*)

TRIBE VII. POTTIEÆ.

33. PHAROMITRIUM, Schimp.

(152.) **P. subsessile,** Schimp.; Lesq. & James, Mosses of N. America, 100.

Gymnostomum subsessile, Drumm. Musc. Bor.-Am., No. 19.

Plains of the Saskatchewan. (*Drummond.*) On dry earth near Ashcroft, B.C., 1875. (*Macoun.*)

34. POTTIA, Ehrh.

(153.) **P. cavifolia,** Ehrh.; Lesq. & James, Mosses of N. America, 101.

Gmynostomum ovatum, Drumm. Musc. Bor.-Am., Nos. 17 and 18.

Mountain prairies and plains of the Saskatchewan (17). Rocky Mountains; very rare (18.) (*Drummond.*) On dry earth in crevices of rocks at Lytton, B.C., 1889. (*Macoun.*)

(154.) **P. truncata,** Fuern.; Lesq. & James, Mosses of N. America, 101; Canadian Musci, No. 62, in part.

On earth in fields, James Terrill's farm, near Wooler, Northumberland Co., Ont. (*Macoun.*)

(155.) **P. intermedia,** Fuern. ; Braithw. British Moss-Flora, 197.

P. truncata, Canadian Musci, No. 62, in part.

On earth on the Portage between Lesser Slave Lake and Peace River, September 23rd, 1872. (*Macoun.*)

(156.) **P. littoralis,** Mitt. ; Braithw. British Moss-Flora, 198.

P. truncata, Canadian Musci, No. 62, in part.

On earth at Yale, B.C., May 17th, 1875. (*Macoun.*)

(157.) **P. Heimii,** Fuern. ; Lesq. & James, Mosses of N. America, 102.

Gymnostomum Heimii, var. I., var. II., var. III., Drumm. Musc. Bor.-Am., Nos. 13, 14 and 15 respectively.

Muddy swamps in the mountains ; rare (No. 13) ; muddy swamps in the mountains (No. 14); bank of Hayes River below York Factory, Hudson Bay (No. 15). (*Drummond.*) Greenland. (*Fl. Gr.*)

(158.) **P. latifolia,** Muell. ; Lesq. & James, Mosses of N. America, 103.

Greenland. (*Fl. Gr.*) On rocks, Mount Alymer, Rocky Mountains, alt. 8,000. (*Macoun.*)

Var. **pilifera,** Muell. ; Lesq. & James, Mosses of N. America, 104.

Weissia latifolia, Drumm. Musc. Bor.-Am., No. 70.

Summits of the mountains ; not uncommon. (*Drummond.*) On earth near Câche Creek, B.C. (*Macoun.*)

(159.) **P. heimioides,** Kindb. (n. sp.)

Nearly allied to *P. Heimii* but differs in the leaves being shorter, the lower obtuse, the costa sometimes excurrent, the capsule longer and narrower, cylindric, the seta golden yellow, and the peristome present but rudimentary.

The allied *Pottia riparia,* Aust., is described by Lesq. & James as having " a conical mamillate lid, the costa of the leaves vanishing below the apex." These characters do not correspond with the Canadian specimens (No. 719 from Câche Creek, B.C., May 25th, 1875, and Canadian Musci from the Gaspé coast), sent by Prof. Macoun ; they probably belong to another new species.

On earth along Cave Avenue, a little above the Bow River Bridge, National Park, Banff, Rocky Mountains, July 4th, 1891. (*Macoun.*)

35. DIDYMODON, Hedw.

(160.) **D. rubellus,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 104; Canadian Musci, No. 63.

Weissia curvirostra, Drumm. Musc. Bor.-Am., No. 71.

Very common in the country extending from Canada to the Rocky Mountains. (*Drummond.*) On the ground, Truro, N.S. (*Fowler's Cat.*) On rocks and earth, Tobique River, N.B. (*Hay.*) On rocks, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On rocks, South West Point, Anticosti; rocks at Campbellton, N.B.; on rocks, Truro, N.S.; on damp rocks, Gaspé Co., Que.; on rocks, McKay's woods, Ottawa, at Belleville, Owen Sound, Port Dover and Niagara Falls, Ont.; on rocks at Kakabeka Falls, Kaministiquia River, Lake Superior; on earth, Lake Winnipegoosis, Man.; on rocks, Cypress Hills, Alberta; rocks at Morley, Banff and Hector, Rocky Mountains; at Revelstoke, Deer Park and Sproat, Columbia River; at Spence's Bridge and Lytton, B.C.; and frequent on Vancouver Island. (*Macoun.*) Jakobshavn, Greenland. (*R. Brown.*) Near London, Ont. (*J. Dearness.*)

(161.) **D. Canadensis,** Kindb. (n. sp.)

Differs from *D. rubellus* principally in the perichetial leaves being thinner, from the ovate base, abruptly attenuate to a short subulate acumen; borders not reflexed; basal cells very long; costa thinner. Dicœcious.

On perpendicular rocks, head of Lake Louise, Rocky Mountains, Aug. 18th, 1891. (*Macoun.*)

(162.) **D. luridus,** Hornsch.; Lesq. & James, Mosses of N. America, 104; Canadian Musci, No. 64.

D. trifarium, Drumm. Musc. Bor.-Am., No. 120.

About the Falls of Niagara. (*Drummond.*) Abundant on limestone ledges and great boulders at Jones Falls, near Owen Sound; on limestone boulders below the Clifton House, Niagara Falls; on rocks at Hector, Rocky Mountains. (*Macoun.*)

(163.) **D. rufus,** Lorentz; Greenland Flora, 384.

Greenland. (*Fl. Gr.*)

(164.) **D. cylindricus,** (Bruch.) Bruch & Schimp.; Lesq. & James, Mosses of N. America, 105.

On rocks at Wiarton, Bruce Co., Ont. (*Macoun.*) God'ıavn, Greenland. (*Fl. Gr.*) Miquelon Island. (*Delàmare.*)

36. LEPTODONTIUM, Hampe.

(165.) **L. Canadense,** Kindb. (n. sp.)

Tufts loosely cohering, nearly without rhizoides, dark green, blackish below. Stem about 1 cm. high, nearly simple. Leaves squarrose, flexuose, undulate and not recurved at the borders, when dry curled-sublingulate, acute, entire below the middle, coarsely and unequally serrate above, not margined; lower basal cells rectangular and subpellucid, the upper at the middle quadrate, the uppermost rotundate, slightly papillose; costa finally brown, short excurrent. Dicœcious; only female plants found.

In this species the leaves are larger than in the European species. It is peculiar that this genus has not been represented before in the North American Moss-Flora.

On stones in the Sydenham River below Jones Falls, Owen Sound, Ont., Sept. 17th, 1890. (*Macoun.*)

37. LEPTOTRICHUM, Hampe.

(166.) **L. tortile,** Muell.; Lesq. & James, Mosses of N. America, 105; Canadian Musci, No. 65.

Didymodon tortile, Drumm. Musc. Bor.-Am., No. 118.

Portage between Fort William and Rainy Lake, west of Lake Superior. (*Drummond.*) Growing on clay, Nipisiquit Falls, Kent Co., N.B. (*Fowler's Cat.*) Nottingham Island, Hudson Strait. (*R. Bell.*) On earth at Truro, N.S. (*Macoun.*) On earth at Canaan Forks, Queen's Co., and Tay, York Co., N.B. (*J. Moser.*) New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Pictou, N.S. (*McKay.*)

(167.) **L. vaginans,** Lesq. & James, Mosses of N. America, 106; Canadian Musci, No. 386.

On earth by roadsides, Brackley Point, Prince Edward Island. (*Macoun.*) On roadsides, Kent Co., N.B. (*Fowler's Cat.*)

(168.) **L. homomallum,** Hampe ; Lesq. & James, Mosses of N. America, 107.

Didymodon heteromallum, Drumm. Musc. Bor.-Am., No. 119.

On earth by the torrent that enters Kicking Horse Lake by the station at Hector, Rocky Mountains, 1890. (*Macoun.*) West side of Rocky Mountains ; sparingly. (*Drummond.*)

(169.) **L. flexicaule,** Hampe ; Lesq. & James, Mosses of N. America, 107 ; Canadian Musci, No. 66.

Didymodon flexicaule, Drumm. Musc. Bor.-Am., Nos. 125-126.

Alpine woods and banks; about Lac de Bois, Rocky Mountains. (*Drummond.*) Twelve-mile Pool, Jupiter River, and Salt Lake, Anticosti ; in a ravine at Whycocogmah, Cape Breton ; on rocks at the mouth of Peace River Cañon, lat. 56° ; abundant on wet rocks by the torrent at Hector and at Banff, Rocky Mountains ; on rocks, Lake Mara, at Sicamous, B.C. ; abundant on rocks along the Columbia River, above Revelstoke, also at Deer Park on Lower Arrow Lake, B.C. (*Macoun.*) Jakobshavn, Greenland. (*Fl. Gr.*)

*L. **brevifolium,** Kindb., n. subsp.

Leaves very small, from the ovate-oblong base contracted to a shorter point; costa not excurrent. This form is perhaps a distinct and proper species; the tufts are quite barren.

On rocks in the "Dry Cañon" near the discharge of Devil's Lake, National Park, Rocky Mountains, Aug. 10th, 1891. (*Macoun.*)

Var. **densum,** Schimp. ; Canadian Musci, No. 461.

On rocks at Morley, Banff and Hector, Rocky Mountains ; on damp earth along the Columbia River at Donald and Revelstoke, B.C. (*Macoun.*)

(170.) **L. pallidum,** Hampe ; Lesq. & James, Mosses of N. America, 107 ; Canadian Musci, No. 67.

On the ground in woods west of Belleville ; in woods near Bismarck, and at Leamington, Ont. (*Macoun.*)

(171.) **L. glaucescens,** Hampe ; Lesq. & James, Mosses of N. America, 108 ; Canadian Musci, No. 68.

Didymodon glaucescens, Drumm. Musc. Bor.-Am., No. 117.

Upon the shores of Lake Superior, and near York Factory, Hudson

Bay. (*Drummond.*) Bank of St. Anne des Monts River, Gaspé Co., and crevices of rocks along the Gatineau, at Kirk's Ferry and at Leamy's Lake, near Hull, Que.; on the shores of Oak Hills Pond, Hastings Co., and by the shores of many others in the same county; shore of Lake Nipissing, Ont.; on the bank of a brook at Sicamous, B.C. (*Macoun.*) Near the summit of Mount Queest, Gold Range, B.C. (*J. M. Macoun.*) Godhavn, Greenland. (*Fl. Gr.*)

38. TRICHOSTOMUM, Smith.

(172.) **T. tophaceum,** Brid.; Lesq. & James, Mosses of N. America, 109.

Owen Sound, Ontario. (*Mrs. Roy.*) Niagara Falls. (*Olney.*) On calcareous rocks, Hudson Hope, Peace River, lat. 56°, 1872; on earth in fields near Wooler, Ont. (*Macoun.*)

39. DESMATODON, Brid.

(173.) **D. latifolius,** Brid.; Lesq. & James, Mosses of N. America, 111; Canadian Musci, No. 69, in part.

Dicranum latifolium, Drumm. Musc. Bor.-Am., No. 109.

Moist marshy places and banks of rivers amongst the Rocky Mountains. (*Drummond.*) On earth at Edmonton, N.W.T.; not rare on earth on the Rocky Mountains in the National Park at Banff; Blackwater River, and mountains north of Griffin Lake, B.C. (*Macoun.*) Summit of Mount Queest, Gold Range, B.C. (*J. M. Macoun.*) Christianshaab, Greenland. (*Fl. Gr.*)

(174.) **D. Systylius,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 111; Canadian Musci, No. 71, in part.

Moist, marshy places, among the Rocky Mountains. (*Drummond.*) On earth, Boggy Creek, Manitoba, 1872. (*Macoun.*) Disco, Greenland. (*Fl. Gr.*)

(175.) **D. Porteri,** James; Lesq. & James, Mosses of N. America, 112; Canadian Musci, No. 70.

On rocks along the Gaspé coast, 1882; also at the bases of trees on stones, extremity of Pelee Point, Lake Erie. (*Macoun.*) Niagara Falls. (*G. W. Clinton.*)

(176.) **D. obtusifolius,** Schimp.; Lesq. & James, Mosses of N. America, 114.

Didymodon oblongifolium, (n. sp.) Drumm. Musc. Bor.-Am., No. 114.
D. latifolium, Drumm. Musc. Bor.-Am., No. 115.

Mountain-rocks; often on the under side of projecting ledges and moist marshy places, Rocky Mountains. (*Drummond.*)

(177.) **D. subtorquescens,** C. M. & Kindb. (n. sp.)

D. latifolius, Canadian Musci, No. 69, in part.

Nearly allied to *D. atrovirens,* Smith, (*D. nervosus,* Bruch & Schimp. and Lesq. & James), but the tufts are compact, the stem higher, (about 1 cm.), the leaves green, not dingy, very short, suboval or subspathulate, smaller, less opaque, the costa neither excurrent nor broader above, the capsule cylindric.

The description of *D. nervosus* by Lesq. & James corresponds nearly to our species, but not to the true European.

On earth on exposed cliffs along the Gaspé coast above the Madeline River, 10th August, 1882. (*Macoun.*)

(178.) **D. cernuus,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 114; Canadian Musci, No. 71.

On earth, South West Point, Anticosti; on earth at Campbellton, N.B.; on rocks and cliffs along the Gaspé coast; on earth along the Pembina River, northwest of Edmonton, N.W.T.; Câche Creek Mountain, and on wet rocks in a ravine at Kamloops, B.C. (*Macoun.*) Greenland. (*Fl. Gr.*)

Var. **xanthopus,** Kindb. (n. var.)

Leaves less chlorophyllose, costa virescent. Capsule larger; teeth more united; pedicel yellow.

On black earth at the crossing of Boggy Creek on the "Old Trail" leading to Touchwood Hills, Manitoba, 12th August, 1872. (*Macoun.*)

(179.) **D. camptothecius,** Kindb. (n. sp.)

Habit of *Desmatodon cernuus.* Plants densely cæspitose. Leaves long, narrow-lingulate, subobtuse, entire or obscurely crenulate, faintly papillose, marginate and at the base revolute, mucronate by the excurrent greenish costa. Capsule cylindric, arcuate: teeth short, cut in 2 or 4 partly coherent segments; annulus indistinct; lid with a short

oblique beak ; pedicel flexuous, reddish-yellow, 10-12 mm. long; spores, large, about 0.04 mm.

Along the Gaspé coast on rocks close to the sea, August 12th, 1882. (*Macoun.*)

(180.) **D. obliquus,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 115.

Tortula suberecta, (n. sp.) Drumm. Musc. Bor.-Am., No. 145.

Shady alpine places, upon the borders of a stream among the Rocky Mountains. (*Drummond.*) Sabine Island, Greenland. (*Fl. Gr.*)

(181.) **D. Laureri,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 115.

Tortula bryoides, (n. sp.) Drumm. Musc. Bor.-Am., No. 135.

Upon the ground ; on the summit of a hill in the Rocky Mountains, (*Drummond.*) On earth along a ditch near Victoria, Vancouver Island, 1875. (*Macoun.*) Shannon Island, Greenland. (*Fl. Gr.*)

40. LEPTOBARBULA, Schimp.

(182.) **L. berica,** (DeNot.), Schimp. Syn. ed. 2, p. 181.

Trichostomum tenue, Lesq. & James, 106, vide Limpricht, 596.
Leptotrichum tenue, C. Muell. Syn. Musc. I. 447 ; Canadian Musci, No. 486.

On earth close to the railway track at Revelstoke, B.C., May 23rd, 1890. (*Macoun.*)

41. BARBULA, Hedw.

(a.) Aloina. C. Muell. (Kindb., as genus proper.)

(183.) **B. rigida,** Schultz.; Lesq. & James, Mosses of N. America, 116.

On earth at Niagara Falls, 15th June, 1884. (*Macoun.*)

(184.) **B. ambigua,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 116.

On the Fraser River alluvium, at Quesnel, B.C., 31st May, 1875 ; on earth in Peace River Cañon, lat. 56°. (*Macoun.*)

(185.) **B. brevirostris,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 115 ; Canadian Musci, No. 72.

Tortula brevirostris, Drumm. Musc. Bor.-Am., No. 136.

Clay banks among the Rocky Mountains and at York Factory, Hudson Bay. (*Drummond.*) On earth at Morley, foot-hills of Rocky Mountains, 13th June, 1885 ; on earth along Cave Avenue, Banff, Rocky Mountains. (*Macoun.*) Greenland. (*Fl. Gr.*)

(186.) **B. macrorhyncha,** Kindb. (n. sp.)

Habit of *Barbula brevirostris.* Leaves round-ovate, obtuse, involute all around, also at the apex ; costa not excurrent. Capsule oblong-ovoid ; annulus revoluble ; teeth long, twisted at least twice, beak of the lid more than $\frac{2}{3}$ length of capsule ; pedicel pale red or yellowish. Dicœcious. Calyptra unknown.

Differs from *Barbula rigida* in the very much shorter leaves and the longer lid.

On earth, Hastings Road, Tudor, North Hastings, Ont., August 16th, 1874. (*Macoun.*)

(c.) Tortella, C. Muell.

(187.) **B. tortuosa,** Web. & Mohr ; Lesq. & James, Mosses of N. America, 120 ; Canadian Musci, No. 77.

Tortula tortuosa, Drumm. Musc. Bor.-Am., No. 141.

Rocks at Lake Winnipeg ; and amongst the Rocky Mountains, &c. (*Drummond.*) On rocks, Bass River, Kent Co., N.B. (*Fowler's Cat.*) On rocks, Queen's Co., N.B. (*J. Moser.*) On stones, Tobique River, N.B. (*Hay.*) On rocks Ste. Anne's River and Mount Albert, Gaspé Co., Que. ; on rocks in McKay's Woods at Ottawa ; common on rocks at Shannonville, Belleville, Owen Sound and Lake Nipigon, Ont. ; Jupiter River, Anticosti ; on rocks at Hector and Banff, Rocky Mountains ; at Revelstoke, Deer Park and Sproat on the Columbia River ; Fort St. James, Northern British Columbia ; Mount Arrowsmith, Vancouver Island. (*Macoun.*) Mount Queest, Gold Range, B.C. (*J. M. Macoun.*) On rocks, Newfoundland. (*Rev. A. Waghorne.*) Greenland. (*Fl. Gr.*) Miquelon Island. (*Delàmare.*)

(188.) **B. inclinatula,** C. M. & Kindb. (n. sp.) Canadian Musci, No. 512.

Dicœcious. Tufts laxly coherent, yellowish green. Stem indistinct, or 0.5 cm. high, not branching. Leaves cirrhate-crisped and rigid

when dry, suberect and nearly straight when moist, not undulate, from a thin ovate-oblong base attenuate, nearly sublinear, acute or suddenly pointed, very papillose ; margins involute, cucullate above ; costa yellow pellucid, excurrent in an often denticulate point. Perichetial leaves much broader and longer than the other, whitish, from a long lanceolate base subulate ; cells narrow, linear also above. Capsule narrow-cylindric, nearly straight, suberect ; peristome long, several times convolute.

This species resembles rather the European *Barbula inclinata* (Hedw. f.) than *B. tortuosa*, which has a larger capsule, longer leaves, taller stems, &c.

On earth and gravel on bars along old channels of the Illicillewaet, near Revelstoke, B.C.; fruiting abundantly, May 27th, 1890. (*Macoun.*)

(189.) **B. fragilis,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 129 ; Canadian Musci, No. 78.

Tortula tortuosa, var. *inclinata*, Drumm. Musc. Bor.-Am., No. 142.
Didymodon fragile, (n. sp.), Drumm. Musc. Bor.-Am., No. 127.

Dry mountain prairies ; upon the " Height of Land " in the Rocky Mountains (142) ; margins of alpine lakes ; fruit very rare (127). (*Drummond.*) River du Loup (*en bas*) Que. (*St. Cyr.*) Rocks along the bed of Ste. Anne des Monts River, at the base of Mount Albert, Gaspé Co., Que. ; abundant on the borders of marshy streams at Hector and Banff, Rocky Mountains ; fruit very scarce. (*Macoun.*) North Shore of Lake Superior. (*Agassiz.*) Disco, Greenland. (*Fl. Gr.*)

(190.) **B. cæspitosa,** Schwaegr. ; Lesq. & James, Mosses of N. America, 129.

On earth at the base of trees in woods at Belleville, and near the " Big Swamp " Murray, and in Seymour West, Northumberland Co., Ont. ; roots of trees, North Bay, Lake Nipissing. (*Macoun.*)

(d.) EUBARBULA, C. Muell.

(191.) **B. Vahliana,** Schultz ; Lesq. & James, Mosses of N. America, 117.

On earth at Yale, B.C., May 17th, 1875. (*Macoun.*)

(192.) **B. amplexa,** Lesq. ; Lesq. & James, Mosses of N. America, 118.

Tortula humilis, Drumm. Musc. Bor.-Am., No. 137.

Limestone rocks of Lake Winnipeg. (*Drummond.*)

(193.) **B. carnifolia,** C. M. & Kindb. (n. sp.)

Stem very short, 2-3 mm. high. Leaves lingulate, not margined, blunt; margins recurved below and above the middle at one side; cells finally sub-pellucid, the upper sub-quadrate, also the median, the lower basal near the costa large, rectangular and hyaline, the marginal shorter and narrower, costa red, thick, and sub-percurrent or rarely short excurrent. Inner perichetial leaves smaller and shorter. Capsule longer than the straight lid; pedicel about 1.5 cm. long. Probably dicœcious.

(194.) **B. subcarnifolia,** C. M. & Kindb. (n. sp.)

Smaller than *B. carnifolia*, differing principally in the leaves being short, suboblong, short-apiculate, the upper pellucid at the flat margins, the costa green. Probably moncœcious.

Differs from *B. amplexa* in the capsule being longer than the oblique lid.

On earth at the base of trees, Pelee Island, Lake Erie, 13th June, 1882. (*Macoun.*)

(e.) SENOPHYLLUM, C. Muell.

(195.) **B. platyneura,** C. M. & Kindb. (n. sp.)

Dicœcious. Tufts compact subpulvinate, light brown. Stem scarcely 1 cm. high. Leaves suberect, when dry imbricate and contorted, short, ovate or ovate-oblong, subacute, papillose; margins strongly revolute; basal cells short-rectangular, the other subquadrate; costa thick, short excurrent or per current. Barren.

Nearly allied to the European *B. revoluta*, Schrad., but clearly distinct in the always shorter, and less obtuse leaves.

On dry rocks at the Deer Park, Lower Arrow Lake, Columbia River, B.C., June 11th, 1890. (*Macoun.*)

(196.) **B. (Trichostomum) nitidum,** (Lindb.) Jur.

On wet earth at Hector, Rocky Mountains, August 14th, 1890. (*Macoun.*).

(197.) **B. gracilis,** Schwaegr.; Lesq. & James, Mosses of N. America, 127.

On sandstone rocks along the Peace River, below Dunvegan, and within the Rocky Mountains along that river, lat. 56″ 12′. (*Macoun.*)

(198.) **B. subgracilis,** C. M. & Kindb. (n. sp.)

Densely tufted. Plants small, about 0.6 cm. high, green above, red-brown below, nearly simple. Leaves when dry subcrispate, when moistened squarrose, curved from the ovate base, narrow, long-subulate, nearly smooth ; borders reflexed nearly all around ; lower basal cells rectangular, more pellucid than the other ; costa reddish, percurrent or short-excurrent. Inner perichetial leaves broad, blunt with a long-excurrent costa, the other acuminate, all faintly crenulate. Capsule oblong-cylindric, red-brown, longer than the subulate oblique beak ; pedicel red. Dicœcious. Allied to *Barbula gracilis.*

On rocks at Yale, B.C., May 17th, 1889. (*Macoun.*)

(199.) **B. subicmadophila,** C. M. & Kindb. (n. sp.)

B. gracilis, var. *squarrulosa,* Kindb., Bull. Torr. Bot. Club, Vol. XVII. 89.

Laxly tufted. Plants about 1 cm. high, pale brown, nearly simple. Leaves when dry loosely appressed, when moistened subquarrose or patent, nearly straight, short, ovate-lanceolate acute, faintly papillose ; borders slightly reflexed at the base, inflexed at the upper part, papillose-crenulate ; cells nearly uniform, roundish or subquadrate, the apical often larger and pellucid ; costa pale, percurrent. Perichetial leaves from a short ovate base long-acuminate sublinear ; costa dark-brown, long-excurrent, filling nearly the whole acumen. Capsule oblong-cylindric, finally blackish ; pedicel dark-brown. Dicœcious.

Habit of *Barbula fallax* or *B. gracilis,* but differing at once in the leaf-borders being scarcely reflexed. In the European *Barbula icmadophila,* Bryol., Europ., the leaves are smooth, and the upper furnished with a long-excurrent costa.

On dry rocks, but which are covered at high water, at Yale, B.C., May 17th, 1875. (*Macoun,*)

(200.) **B. fallax,** Hedw. ; Lesq. & James, Mosses of N. America, 121.

Tortula fallax, Drumm. Musc. Bor.-Am. No. 139.
Dicranum pellucidum, Drumm. Musc. Bor.-Am., No. 108.

Banks of rivers near the Rocky Mountains ; apparently rare. Rocks of Portage River near the Columbia River. (*Drummond.*) Bass River, Kent Co., N.B. (*Fowler's Cat.*) On earth at Owen Sound, Ont., 1874 ; on earth at the base of trees, Comox, Vancouver Island ; on sand along Ste. Anne des Monts River, Gaspé, Que. (*Macoun.*) Jakobshavn, Greenland. (*R. Brown.*)

(201.) **B. recurvifolia,** Schimp. ; Lesq. & James, Mosses of N. America, 122.

On rocks near Lake La Mab, North Hastings, Ont., 15th August, 1874. (*Macoun.*) Niagara Falls. (*Austin.*)

(202.) **B. sparsidens,** C. M. & Kindb. (n. sp.)

Loosely tufted. Plants small, 0.5-1 cm. high, green above, ferrugineous below, nearly simple. Leaves small, when dry incurved, when moistened subquarrose, arcuate, ovate-lanceolate, distinctly papillose ; borders reflexed nearly all around ; lower basal cells rectangular, hyaline ; costa pale, rough at back, percurrent. Inner perichetial leaves shorter than the outer ; costa not or very short-excurrent. Capsule small, oblong-cylindric, reddish, longer than the oblique beak ; peristome and pedicel red. Dicœcious. Allied to *Barbula fallax*, but differing principally in the peristomial teeth, spreading, loosely and not spirally twisted.

On earth along the west side of the Columbia River, at Revelstoke, B.C.. May 3rd, 1890. (*Macoun.*)

(203.) **B. melanocarpa,** C. M. & Kindb. (n. sp.)

Laxly tufted. Fertile stem nearly simple, about $\frac{1}{5}$ cm. high, the barren branching, doubly higher. Leaves when dry appressed, not twisted, when moistened open, olive-green, short ovate-lanceolate acute, slightly papillose ; borders reflexed below the middle ; cells nearly uniform, roundish or subquadrate ; costa brown, short-excurrent. Perichetial leaves from the ovate-oblong base long-acuminate, costa filling the whole linear acumen. Capsule oblong-cylindric straight, finally blackish, obliquely short-beaked ; annulus not distinct ; pedicel red. Dicœcious. Allied to *Barbula subicmadophila.*

On rocks along the Fraser, close to the water at Yale, B.C., May 18th, 1887. (*Macoun.*)

(204.) **B. rigidula,** Schimp. ; Lesq. & James, Mosses of N. America, 123.

Didymodon rigidulum Drumm. Musc. Bor.-Am., 121.

On rocks amongst the Rocky Mountains ; rare. (*Drummond.*) On the roots of trees close to the water, west side of Colpoy's Bay, Georgian Bay, Lake Huron ; and on earth at Owen Sound, Ont. (*Macoun.*) Greenland. (*Fl. Gr.*)

(205.) **B. spadicea,** Mitt.; Braithw. British Moss-Flora, 266.

B. rigidula, Canadian Musci, No. 412.

Differing from *B. rigidula* in the leaves being more curved, and broader pointed, the costa distinct to the apex; from *B. fallax* in the scarcely twisted peristome. On earth by a brook at Lytton, B.C., April 17th, 1889. (*Macoun.*)

(206.) **B. unguiculata,** Hedw.; Lesq. & James, Mosses of N. America, 120; Canadian Musci, No. 73.

Tortula unguiculata, Drumm. Musc. Bor.-Am., No. 140.

In Upper Canada; and about Carlton House, &c. (*Drummond.*) Common on earth at Bass River, Kent Co., N.B. (*Fowler's Cat.*) Pictou, N.S. (*McKay.*) Tay, York Co. and Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Very common on the borders of old roads in and around Ottawa, Belleville and Owen Sound, Ont.; on earth along old roads at Revelstoke on the Columbia River, and at Câche Creek, B.C. (*Macoun.*) Very common in sandy soil at London, Ont (*J. Dearness.*)

(207.) **B. brachyphylla,** Sulliv. Var. **angustifolia,** Kindb (n. var.)

On calcareous rocks where water drips in spring, Deer Park, Lower Arrow Lake, Columbia River, B.C., June 8th, 1890. (*Macoun.*)

(208.) **B. (Didymodon ?) cœnea,** C. M. & Kindb. (n. sp.)

Dicœcious. Tufts loose, purple, without rhizoids. Stems about 1 cm. high, branches not divided. Leaves nearly straight, loosely appressed when dry, patent when moist, short ovate-lanceolate attenuate, acute, papillose; margins faintly revolute at the base, also above at least on one side; costa red, subpercurrent; basal cells rectangular pellucid, the other subquadrate, dusky. Barren.

Nearly allied to the European (also occurring in Greenland) *Barbula* (*Didymodon*) *rufa,* Lor., which has the branches divided and the leaves brown-red with a different areolation.

On earth subject to inundation one and a half miles above Revelstoke, along the Columbia River, B.C., May 12th, 1890. (*Macoun.*)

(209.) **B. rubiginosa,** Mitt.; Lesq. & James, Mosses of N. America, 126.

North West Coast. (*Douglas.*) I believe Douglas' specimens to be *B. robustifolia,* C. M. & Kindb. (*Macoun.*)

(210.) **B. cylindrica,** Schimp. ; Lesq. & James, Mosses of N. America, 125 ; Canadian Musci, No. 81, in part.

On rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C., June 11th, 1890; on damp rocks at Spence's Bridge, Yale, and Agassiz, B.C. ; also wet rocks, Cadboro Bay, Vancouver Island. (*Macoun.*)

(211.) **B. robustifolia,** C. M. & Kindb. (n. sp.)

Barbula rubiginosa, Canadian Musci, No. 75.

Very nearly allied to *Barbula tortellifolia.* Differs in the dark brown or olive-green color of the whole plant, the leaves being more crowded, shorter with an ovate-oblong base, borders reflexed nearly to the middle at one side, upper cells larger and sub-pellucid, the basal ones hyaline subquadrate, costa thicker and not excurrent, linear and distinct to the apex. Barren.

Abundant on rocks at Cedar Hill and other localities near Victoria ; also on rocks on Mount Erskine, Salt Spring Island, Gulf of Georgia, B.C. First collected at Victoria, May 5th, 1875, and then named *B. rubiginosa* by Austin. (*Macoun.*)

(212.) **B. tortellifolia,** C. M. & Kindb. (n. sp.)

Barbula cylindrica, Canadian Musci, No. 81, in part.
B. flexifolia, Canadian Musci, No. 399.

This species very much resembles *Barbula horridifolia* in its habit but is found in a well-fruiting state. It is generally more robust, often 4-5 cm. high and finally sometimes quite red. The stem is more divided, the leaves broader, less distinctly decurrent, the comal ones larger and crowded, short-pointed by the excurrent costa ; the perichetial ones suddenly attenuate to a long narrow acumen, but the costa is faintly excurrent. The capsule is large sub-cylindric, reddish doubly longer than the beak ; peristome long, once loosely contorted whitish. Dicœcious.

On wet rocks on the North Arm, Burrard Inlet, B.C. ; on rocks by the sea, Telegraph Bay, near Victoria, Vancouver Island ; also on rocks by the sea, Vesuvius Bay, Salt Spring Island, Gulf of Georgia, B.C. (*Macoun.*)

(213.) **B. circinnatula,** C. M. & Kindb. (n. sp.)

Nearly allied to *Barbula cylindrica* or rather intermediate between *Barbula elata* and *B. virescens.* Differs in the upper leaves being green, circinnate-twisted in the dry state, the peristome paler and the annulus simple ; the areolation of the leaves is also more distinct.

On earth on rocks along the railway a mile east of Agassiz, B.C., May 8th, 1889. (*Macoun.*)

(214.) **B. horridifolia,** C. M. & Kindb. (n. sp.)

Densely tufted. Plants about 3 cm. high, green above, rusty-red below, more or less branching. Leaves dry irregularly crispate, when moistened falcate, spreading at all sides, very long and narrow, ovate-lanceolate, carinate above, loosely disposed and long-decurrent, nearly smooth ; borders reflexed at the ovate base ; basal cells pellucid, short-rectangular, the inner larger ; upper cells small and obscure ; costa red-brown, broader below, narrower above, vanishing in the apex. Barren.

This species is allied to *Barbula cylindrica* (Tayl.) Lindb., but differs principally in the decurrent leaves and the attenuate costa.

On damp rocks, near the whirlpool, west of the Columbia River, at Revelstoke, B.C., May 9th, 1890. (*Macoun.*)

(215.) **B. convoluta,** Hedw. ; Lesq. & James, Mosses of N. America, 127 ; Canadian Musci, No. 76.

Tortula convoluta, Drumm. Musc. Bor.-Am., No. 138.

Sandy soil in the country extending from Canada to the Rocky Mountains. (*Drummond.*) On pasture fields and by roadsides at Ottawa, Carlton Place, Belleville, Niagara Falls and Owen Sound, Ont. ; on earth at Victoria and Comox, Vancouver Island. (*Macoun.*) On earth, very common at London, Ont. (*J. Dearness.*)

(216.) **B. chrysopoda,** C. M. & Kindb. (n. sp.)

Differs from *Barbula convoluta* in the short nearly indistinct stem, the leaves sub-lingulate, very obtuse, the perichetial leaves rounded or truncate at the apex, long exserted, the lid spirally contorted.

On earth in the burnt woods around Revelstoke ; especially along old roads, May 17th, 1890. (*Macoun.*)

(f.) SYNTRICHIA, C. Muell.

(217.) **B. subulata,** Beauv. ; Lesq. & James, Mosses of N. America, 130.

Tortula subulata, Drumm. Musc. Bor.-Am., No. 144.

In the country from Canada to the Rocky Mountains ; upon the ground. (*Drummond.*) On earth in the country north of Edmonton, N.W.T, ; on earth along the Fraser River, below Lytton, B.C. ; and on rocks, Point Wilkins, Lake Winnipegoosis, Man. (*Macoun.*)

Var. **longifolia,** Kindb., Bull. Torr. Bot. Club, Vol. XVII., 89.

Intermediate between *B. subulata* and *B. angustata.* Leaves long and narrow, acuminate and acute, distinctly denticulate above, papillose, yellow, bordered ; costa long-excurrent, but shorter in the perichetial leaves.

On earth, Cypress Hills, Alberta ; on earth at Câche Creek, Yale and Lytton, B.C. ; vicinity of Victoria, Vancouver Island, May 7th, 1875. (*Macoun.*)

(218.) **B. mucronifolia,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 131 ; Canadian Musci, No. 80.

On rocks at Truro, N.S. (*Fowler's Cat.*) On calcareous earth, Jupiter River, Anticosti ; crevices of limestone rocks at Belleville, Ont. (*Macoun.*) Sandy banks of the St. Lawrence at Fox River, Gaspé Co., Que. (*J. A. Allen.*) Jakobshavn, Greenland. (*Fl. Gr.*)

(219.) **B. angustata,** Wils. ; Braithw. British Moss-Flora, 221 ; Canadian Musci, No. 413.

B. subulata, Beauv. var. *angustata,* Schimp. ; Lesq. & James, Mosses of N. America, 131.

Resembling *B. subulata,* but more slender. Leaves narrowly ovate-lanceolate, acute, nearly smooth, margin incrassate, hyaline. Capsule paler, suberect, narrowly cylindric. On sandy soil near London, Ont. (*J. Dearness.*) On sand at the extreme end of Pelee Point, Lake Erie ; on rocks at Morley, Rocky Mountains ; on earth at Lytton, Spence's Bridge and Agassiz, B.C. (*Macoun.*)

(220.) **B. ruralis,** Hedw. ; Lesq. & James, Mosses of N. America 132 ; Canadian Musci, No. 82.

Tortula ruralis, Drumm. Musc. Bor.-Am., No. 143.

Various parts of the country ; scarcely common. (*Drummond.*) On limestone rocks at Ottawa, Belleville, Owen Sound and Niagara Falls ; also at Flat Rock Portage, Lake Nepigon ; on rocks near Victoria, Vancouver Island ; dry rocks, Kananaskis Station, Rocky Mountains. (*Macoun.*) Smith's Sound, between lat. 78°—82°. (*Dr. Hayes.*) Shannon Island, Greenland. (*Fl. Gr.*)

(221.) **B. alpina,** Bruch & Schimp.

On rocks, at Quesnel, B.C., May 29th. 1875. (*Macoun.*)

(222.) **B. aciphylla,** Bruch & Schimp. ; Canadian Musci, No. 479.

On rocks, Mount Queest, Gold Range, B.C. (*J. M. Macoun.*) On rocks, mountains north of Griffin Lake, Gold Range, B.C. ; dry rocks at Hector, Rocky Mountains, and in Roger's Pass, Selkirk Mountains, B.C. (*Macoun.*) Disco Island, Greenland. (*Fl. Gr.*)

(223.) **B. megalocarpa,** Kindb. Bull. Torr. Bot. Club, XVI. 92 ; Canadian Musci, No. 79.

Allied to *B. ruralis*, but differs in the capsule being very much longer and cylindrical, at least twice the length of the conic operculum, the peristome shorter than the tubulose base and calyptra very much prolonged below the capsule, the middle leaves more distant, the upper leaves subacute not emarginate or rounded at the apex, and rather acute ; the hair-point is red at the base, and the leaf-base narrowly or not margined, with pale-yellow cells.

On rocks, Cypress Hills, Alberta ; common on rocks at Revelstoke on the Columbia River, at Deer Park, Lower Arrow Lake, and Sproat at Pass Creek ; on rocks at Sicamous and Yale, B.C. ; very common on rocks at Victoria, Comox and other places on Vancouver Island. (*Macoun.*) It exists also as a variety with a smaller capsule.

(224.) **B. lævipila,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 132.

Vancouver Island. (*Lyall.*) May this not be *B. lato-excisa*, C. M. & Kindb. ? (*Macoun.*)

(225.) **B. brachyangia,** C. M. & Kindb. (n. sp.)

Dicœcious. Plants brown-ferruginous, 2-3 cm. high. Leaves small, the upper close, curved, short ovate-oblong, obtuse or subacute, the upper part scarcely longer than the sheathing base ; margins slightly recurved in the middle ; broad cells hyaline, nearly uniform ; costa rough at back ; hairpoint long, denticulate, the greater part pale red. Capsule small and short, oblong-cylindric, sub-symmetric ; pedicel red 1.5-2 cm. long.

This species is very distinct from *Barbula ruralis* in the short, nearly flat leaves, the hyaline leaf-base, and the small capsule.

On rocks along Becscie River, Anticosti, September 3rd, 1883. Has been included in *B. ruralis.* (*Macoun.*)

(226.) **B. lato-excisa,** C. M. & Kindb. (n. sp.)

B. lævipila, Canadian Musci, No. 74, in part.

Differs from *Barbula leptotricha* in the leaves being green, nearly flat at the borders; the outer basal cells faintly chlorophyllose, narrowly marginate.

On the bases of trees, on Mount Tolmie, near Victoria, Vancouver Island, May 20th, 1887. (*Macoun.*)

(227.) **B. papillinervis,** C. M. & Kindb. MS. (n. sp.)

Allied to *B. ruralis.* Upper leaves subacute, leaf-base narrowly margined, with pale-yellow cells; calyptra very much prolonged below the capsule.

On rocks at Câche Creek, B.C., May 25th, 1875; also on dry rocks at Revelstoke, Columbia River, B.C., 1890; on rocks west side of Lower Arrow Lake, Columbia River, B.C. (*Macoun.*)

(228.) **B. leptotricha,** C. M. & Kindb. (n. sp.)

Differs from *Barbula ruralis,* principally in the shorter leaves, emarginate at the apex, with a fine and nearly smooth hair-point; the basal cells hyaline.

On limestone rocks, Point Wilkins, Lake Winnipegoosis, Manitoba, July 16th, 1881. (*Macoun.*)

(229.) **B. (Syntrichia?) rotundo-emarginata,** C. M. & Kindb. (n. sp.)

Dicœcious. Plants loosely tufted, brown, about 1 cm. high. Stem beset with emarcid leaves or naked below. Comal leaves close, patent when moist, scarcely curved, papillose, short obcordate, not sheathing; margins slightly or not recurved; cells subquadrate, the inner basal greater and hyaline; costa red and thick, faintly rough at back, excurrent into a long, hyaline, or at the base reddish, more or less denticulate hair-point.

This species belongs either to the section *Syntrichia* or to *Eubarbula* (*Cuneifoliæ*); the leaves are larger than in *Barbula carnifolia.*

(230.) **B. Muelleri,** Bruch & Schimp.; Lesq. & James, Mosses of North America, 133; Canadian Musci, No. 83.

On earth in the mountains at Yale, B.C.; on rocks in the vicinity of Victoria, Vancouver Island. (*Macoun.*) On rocks, Alert Bay, Vancouver Island. (*Dawson.*) Alaska. (*Roth. Alask.*)

VIII. GRIMMIEÆ.

42. CINCLIDOTUS, Beauv.

(231.) **C. fontinaloides,** Beauv.; Lesq. & James, Mosses of N America, 134.

On rocks in the bed of a creek, Ontario, Canada. (*Lesq. & James.*)

43. SCOULERIA, Hook.

(232.) **S. aquatica,** Hook.; Drumm. Musc. Bor.-Am., No. 63.

Grimmia Scouleria, Lesq. & James, Mosses of North America, 137.
Scouleria aquatica, var. *virescens,* Kindb., Bull. Torr. Bot. Club XVI., 93 Canadian Musci, No. 105.

Upon stones in the Columbia and Portage rivers. (*Drummond.*) On stones in mountain brooks and in the Fraser River at Yale, B.C.; fruiting abundantly; also on rocks in a mountain brook, Lake Mara, near Sicamous, B.C. (*Macoun.*)

(233.) **S. Nevii,** C. Muell., Bull. Torr. Bot. Club XVII., 273.

S. aquatica, var. *nigrescens,* Kindb., Bull. Torr. Bot. Club, XVI. 94; Canadian Musci, No. 388.

Leaves when dry more or less patent, dark green, broader near the middle, very short-acuminate, suboblong-elliptic, obtusely dentate also below the middle, entire in the broad rounded apex, margined by obscure cells; upper cells dusky, the lower subpellucid, the median of the base linear and not porose. *Scouleria aquatica* has the leaves when dry appressed and blackish (only the uppermost green), broader at the base, narrow below the middle and acuminate, ovate-lanceolate, sharply serrate from the middle to the contracted apex, very distinctly margined by obscure cells; the most of the cells dusky and thick-walled except the few median linear not porose ones of the base; inner perichetial leaves shorter, less dusky; perigonial leaves short, suboval and very obtuse.

On rocks in Glacier Creek, Roger's Pass, Selkirk Mountains, B.C.; in a mountain brook, Lake Mara, near Sicamous, B.C.; on rocks in the Nanaimo River, below the railway bridge, near Nanaimo, Vancouver Island. (*Macoun.*)

(234.) **S. Muelleri,** Kindb. (n. sp.) Canadian Musci No. 558.

Leaves when dry loosely appressed and dark green, broader above the base, oblong-ovate or nearly ellipitic, very short-acuminate, sharply serrate above, already below, the middle; entire in the broad rounded apex, indistinctly margined by pale-orange cells; all cells subpellucid, the median at the base linear, porose and numerous. Inner perichetial leaves longer, from the short dilated and entire base sublinear and serrate, very pellucid.

On boulders in the Columbia River, about a mile and a half above Revelstoke, B.C., on the east side of the river, May 12th, 1890. (*Macoun.*)

44. GRIMMIA. Ehrh.

(A.) Schistidium.

(235.) **G. conferta,** Funck; Lesq. & James, Mosses of N. America, 135; Canadian Musci, No. 84.

On rocks along Jupiter River, Anticosti; on rocks, shores of Lake Superior and Lake Nepigon, Ont.; on rocks, Fort Chipweyan, Lake Athabasca, and at the Rocky Mountain Cañon, Peace River; on rocks, Stewart's Lake Mountain, at the Blackwater River; and on dry rocks at Lytton on the Fraser River, B.C. (*Macoun.*) On rocks. Mount Queest, Gold Range, B.C. (*J. M. Macoun.*) Pictou, N.S, (*McKay.*) On rocks, Tadousac, Que. (*St. Cyr.*) Tay, York Co., and Canaan Forks, Queen's Co., N.B. (*J. Moser.*)

(236.) **G. Manniæ,** C. Muell.

On dry sun-baked rocks on the right bank of the Thompson River, beyond the bridge at Lytton, B.C., April 17th, 1889. (*Macoun.*)

(237.) **G. apocarpa,** Hedw.; Lesq. & James, Mosses of N. America, 136; Canadian Musci, No. 85.

G. apocarpa var. *stricta*, Drumm. Musc. Bor.-Am. No. 55.

Rocks between Norway House and York Factory, Hudson Bay. (*Drummond.*) Cape Prince of Wales and Nottingham Island, Hudson Strait. (*R. Bell.*) On rocks, Earltown Lake, N.S. (*McKay.*) Common on rocks, St. John Co., N.B. (*Fowler's Cat.*) Tay, York Co., and Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Tadousac, Que. (*St. Cyr.*) Miquelon Island. (*Delàmare.*) Rivière St. Anne des Monts, Gaspé

Co., Que.; on rocks, Jupiter River, Anticosti; abundant on boulders at Ottawa, Carleton Place, Belleville, Niagara Falls, Owen Sound, Lake Superior and Lake Nepigon, Ont.; dry rocks at Morley, Banff and Hector, Rocky Mountains; on boulders along Peace River at the mouth of Smoky River, lat. 56° 12′; on rocks at McLeod's Lake, along the Blackwater River, at Cache Creek, Kamloops, Revelstoke, and Yale, B.C. (*Macoun.*) Mountains south of Tulameen River, B.C., alt. 6,000 feet. (*Dawson.*) On rocks near St. John, Newfoundland. (*Rev. A. Waghorne.*) Limestone rocks at Delaware, near London, Ont. (*J. Dearness.*) On rocks near Kingston Mills, Ont. (*Lawson.*) Sabine Island, Greenland. (*Fl. Gr.*)

(238.) **G. gracilis,** Nees & Hornsch.

G. apocarpa, var. *gracilis*, Lesq. & James, Mosses of N. America, 136; Canadian Musci, No. 86.

On perpendicular rocks, St. Anne des Monts River, Gaspé Co., Que.; rocks around Lake Nepigon, and along the Dawson Route, west of Lake Superior; on dry rocks at Morley, Kananaskis, and Hector, Rocky Mountains; on dry rocks at Revelstoke, Deer Park, Sproat, Sicamous, Yale, Agassiz, and Moodyville on Burrard Inlet, B.C.; Peace River, near Fort St. John. Lat. 56° 12′. (*Macoun.*) On dry rocks at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Tadousac, Que. (*St. Cyr.*)

(239.) **G. rivularis,** Nees & Hornsch.

G. apocarpa, var. *rivularis*, Lesq. & James, Mosses of N. America, 136; Canadian Musci, No. 87.
G. apocarpa, Drumm. Musc. Bor.-Am. No. 54.

On rocks between Norway House and York Factory, Hudson Bay. (*Drummond.*) At Fredericton, N.B. (*Fowler's Cat.*) Wet rocks in a brook at Cape Rosier, Gaspé Co., Que.; wet rocks, north of Lake Superior and along the Dawson Route west of the lake; wet rocks, Kananaskis River near its mouth, Rocky Mountains; on great boulders in the Columbia, one and a half miles above Revelstoke, B.C.; on rocks in Cornwallis River, near Comox, Vancouver Island. (*Macoun.*) Clearwater River, lat, 57°., N.W.T. (*J. M. Macoun.*) On wet rocks, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Greenland. (*Fl. Gr.*)

(240.) **G. alpicola,** Swartz; Musc. Suec.; Flora of Greenland, 346.

West Greenland. (*Fl. Gr.*)

(241.) **G. platyphylla,** Mitt. ; Lesq. & James, Mosses of N. America, 136.

On rocks near the mouth of Smoky River where it enters Peace River, lat. 56° 20′, 1872 ; on rocks by the torrent at Hector, Rocky Mountains, 1890. (*Macoun.*)

(242.) **G. Agassizii,** Lesq. & James, Mosses of N. America, 136.

Rocks washed by the waves, north shore of Lake Superior, 1848. (*Agassiz.*) On large boulders in Bleeker's Grove, within the limits of the city of Belleville, Ont. 1888. (*Macoun.*)

(243.) **G. maritima,** Turn. ; Lesq. & James, Mosses of N. America, 137.

Miquelon Island. (*Delàmare.*) New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

(244.) **G. crassinervis,** C. Muell.

G. maritima, Canadian Musci, No. 88.

Collected on Vancouver Island, near Victoria, by Dr. Rœll. 1888. On rocks washed by the sea, Salt Spring Island, Gulf of Georgia, also on rocks by the sea, at Hastings, Burrard Inlet, B.C. May 9th, 1887. (*Macoun.*)

(245.) **G. chloroblasta,** Kindb. (n. sp.)

G. coscinodontoides, Kindb., Bull. Torr. Bot. Club. XVII., 271 ; Canadian Musci, No. 416.

Differs from *G. conferta* principally in the long, hair-pointed leaves, the perichetial being larger and green, the lid of the capsule short conic-apiculate, the teeth very cribrose, nearly as in *Coscinodon pulvinatus.*

On dry rocks on the mountain overlooking the Thompson River at Spence's Bridge, B.C., alt. 3,500 feet, May 28th, 1889. (*Macoun.*)

(246.) **G. heterophylla,** Kindb., Bull. Torr. Bot. Club, XVII. 271.

Differs from *G. conferta* in the stem being nearly simple, the leaves patent, when dry, the upper canaliculate, margins involute above, the perichetial very much larger, the peristome reddish, not papillose. The tufts are about 2 cm. high, when dry dark green above.

On rocks on the mountains between the Nicola and Thompson rivers at Spence's Bridge, B.C., alt. 3,500 feet, May 28th, 1889. (*Macoun.*)

(247.) **G. atricha,** C. M. & Kindb. (n. sp.)

Differs considerably from *Grimmia conferta* in the tufts densely cohering, the leaves being small and when dry appressed, muticous, short, ordinarily ovate-oblong, not recurved at the margins, the cells not incrassate, the perichetial leaves very much larger and broader than the other ones; capsule more wide-mouthed, teeth of the peristome orange only below, yellow or hyaline above, entire, not rimose nor papillose, lid longer rostrate.

This small moss grows in large, but only 1 cm. high, dry, blackish or when moist, green tufts.

On the sloping face of broken rocks at the summit of the mountains back of Sproat, Columbia River, B.C., alt. 4,000 feet, June 24th, 1890. (*Macoun.*)

(248.) **G. pachyneurula,** C. M. & Kindb. (n. sp.)

Tufts small, green. Leaves small, when dry appressed, not twisted, when moist, speading, short ovate-lanceolate, recurved on both sides, hairless and obtuse; cells uniform subquadrate, not erose, the alar scarcely distinct; costa percurrent, thick, and smooth at the back.

This species is found only in a barren state, but appears to belong to the section *Schistidium*.

On rocks, near the Whirlpool on the west side of the Columbia, at Revelstoke, B.C. May 7th, 1890. (*Macoun.*)

(B.) Eugrimmia.

(249.) **G. anodon,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 138; Canadian Musci, No. 89.

On dry rocks at Morley, foot-hills of Rocky Mountains, and at Lytton, B.C. (*Macoun.*)

(250.) **G. plagiopodia,** Hedw.; Lesq. & James, Mosses of N. America, 138.

On dry rocks, Cypress Hills, Alberta; on sandstone rocks along Peace River, 50 miles below Dunvegan; on rocks, Blackwater River, B.C. (*Macoun.*)

Var. **pilifera,** Lesq. & James, Mosses of N. America, 138; Canadian Musci, No. 511.

On dry rocks along Peterson's Creek, in the flats near the railway station at Kamloops, B.C., 1890. (*Macoun.*)

(251.) **G. nivalis,** Kindb., Bull. Torr. Bot. Club, XVII, 271; Canadian Musci, No. 415.

Tufts blackish, low and compact. Stems denudate below. Leaves dusky above, small, short, ovate-lanceolate, acute, muticous or indistinctly piliferous, flat on the borders, the uppermost and the perichetial ones longer and narrower with a smooth and long hair-point; cells quadrate, chlorophyllose, the lower hyaline, short-rectangular; costa percurrent. Inflorescense dicœcious. Capsule exserted, wide-mouthed when empty, not rugose nor striate; calyptra dimidiate; teeth orange, nearly entire, spreading when dry; lid mammillate; pedicel when dry arcuate, when moist nearly straight, elongate, pale.

Differs from *G. plagiopodia* in the longer acute leaves and the pedicel very much longer than the capsule.

On inclined rocks in compact wide-spreading tufts on the Gold Range, north of Griffin Lake, B.C., alt. 7,000 feet, August 10th, 1889. (*Macoun.*)

(252.) **G. tenella,** C. Muell.; Canadian Musci, No. 501.

This species, allied to *G. nivalis*, is described by C. Mueller, in the revision of the Mosses collected by Dr. Rœll.

Summit of Mount Queest, Gold Range, B.C., alt. 7,000 feet, 1889. (*J. M. Macoun.*) On dry rocks at Deer Park, Lower Arrow Lake, and near the mouth of Pass Creek, Columbia River, B.C., 1890. (*Macoun.*)

(253.) **G. pulvinata,** Smith; Lesq. & James, Mosses of N. America, 138; Canadian Musci, No. 90.

In small tufts on dry rocks on the slopes of Sproat Mountain, Columbia River, and on calcareous tufa at the Hot Springs, Kootanie Lake; dry rocks, Blackwater River, Câche Creek, and at Lytton, B.C.; abundant on Mount Erskine, Salt Spring Island, Gulf of Georgia, B.C. (*Macoun.*)

(254.) **G. sarcocalyx,** Kindb., Bull. Torr. Club, XVII., 271.

Differs from the allied *Grimmia leucophœa* principally in the leaves being furnished with a faintly denticulate hair-point, the capsule short-oval, the lid *obliquely* beaked, the pedicel doubly longer than the capsule, sheath pale-red, inflated and carnose. The leaves are short, very broad at the base as in *G. leucophœa*; the cells are nearly all quadrate.

On rocks on the summit of the mountain between the Nicola and

Thompson rivers at Spence's Bridge, B.C., alt. 3,500 feet, May 28th, 1889. (*Macoun.*)

(255.) **G. contorta,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 139.

On rocks in the vicinity of McLeod's Lake, northern British Columbia, June 25th, 1875. (*Macoun.*)

(256.) **G. funalis,** (Schwægr.) Schimp. ; Braithw. British Moss-Flora, Vol. II. 13.

G. spirilis, Hook. & Taylor ; Flora of Greenland, 347.

Dicœcious. Densely cæspitose, readily falling asunder, grey-green or yellowish green above, reddish brown or fuscous below. Stems 1-2 in. high, slender, erect, sub-dichotomous, free from radicles. Leaves when dry erect and spirally incumbent, when moist erecto-patent, small, lanceolate, upper with hyaline points, or extended into a smooth hair, the margin a little recurved, nerve narrow, vanishing at the apex ; cells at base narrowly rectangular, quadrate and hyaline at margin, above quadrate and sinuose, upper in two strata, minute, quadrate. Perichetial leaves broader at base, concave, piliferous ; pedicel shorter than the perichetial leaves, curved, pale yellow ; calyptra conico mitriform, 5-lobed, capsule small, ovate, pale reddish brown, 8-striate ; annulus broad of 3-4 rows of cells, lid from a convex base ; short-pointed ; teeth rufous purple, lacunose or torn at apex. Male plants taller and more slender ; inflorescence terminal, inner bracts oblong-acute.

Smith's Sound, between lat. 78°—82°. (*Dr. Hayes.*)

(257.) **G. prolifera,** C. M. & Kindb. (n. sp.)

Tufts soft, coherent and very radiculose, dry blackish below, proliferous with long green shoots. Stem slender, naked below, 3-4 cm. long. Leaves dry incurved or crisped, the upper often falcate when moist, narrow, from the oblong appressed subvaginant base attenuate to a shorter acute acumen, muticous or rarely furnished with an apical hair point-like cell, margins recurved at least at one side ; lower basal cells narrow-rectangular, the other and the upper subquadrate, all thin-walled, faintly yellowish and pellucid ; costa yellow-brown, percurrent.

Differs from the allied *Grimmia contorta* (Wahlenb.) principally in the shorter, muticous, at the margin recurved, leaves, the upper more

distant than the lower. It is also distinct from *G. hamulosa*, Lesq. (*fide* C. Mueller.)

(258.) **G. torquata,** Grev. ; Lesq. & James, Mosses of N. America, 140 ; Canadian Musci. No. 91 ; Drumm. Musc. Bor.-Am., No. 58.

Near the "Height of Land" Rocky Mountains. (*Drummond.*) Abundant on rocks at Hector and along the Kicking Horse Pass, Rocky Mountains ; on dry rocks at Revelstoke and Sproat, Columbia River ; also at Sicamous and Agassiz, B.C. ; on rocks at Victoria and on Mount Benson, Vancouver Island ; on Mount Erskine, Salt Spring Island, Gulf of Georgia, B.C. (*Macoun*) Greenland. (*Fl. Gr.*)

(259.) **G. tortifolia,** Kindb. Enumer. Bryin. Doovens. (1888.)

G. streptophylla, Laubm. Schwed. u. Norw.

Nearly allied to *Grimmia torquata*, but differing principally in the shorter leaves and leaf-cells.

On rocks in Eagle Pass, west of Revelstoke, B.C., May 23rd, 1890. (*Macoun.*)

(260.) **G. Muehlenbeckii,** Schimp. ; Lesq. & James, Mosses of N. America, 140.

On rocks Bow River Pass near the "Gap," Rocky Mountains ; on dry rocks, Blackwater River, and at Lytton, B.C. (*Macoun.*) On rocks, Newfoundland. (*Rev. A. Waghorne.*)

(261.) **G. elatior,** Bruch ; Flora of Greenland, 347 ; Braithw. British Moss-Flora, Vol. II., 23.

Dicecious. Plants robust, laxly cæspitose, 3-10 cm. high, black at the base, fuscous-green above. Leaves very long, elongate-lanceolate from a broader base, margins revolute below, gradually attenuated into a smoothish hair, basal cells narrow, upper short, more or less papillose, all slightly sinuose. Capsule ovate 10-striate, when dry, oblong, pale-brown ; calyptra lobate ; annulus of 3 rows of cells ; lid rostellate or sub-acicular ; teeth purple ; pedicel short, pale, arcuate.

Godhavn, Greenland. (*R. Brown.*) On rocks, Mount Alymer, north of Devil's Lake, Rocky Mountains, alt. 8,300 feet, August 6th, 1891. (*Macoun.*)

(262.) **C. trichophylla,** Grev.; Lesq. & James, Mosses of N. America, 141; Canadian Musci, No. 92.

G. Californica, Canadian Musci, No. 93.

On dry rocks, Kicking Horse Lake, Rocky Mountains; on rocks, Blackwater River, Revelstoke, Sicamous, Lytton, and at Yale, B.C.; rocks at Mount Tolmie, near Victoria, Vancouver Island; also on Mount Erskine, Salt Spring Island, Gulf of Georgia, B.C.; and abundant on rocks at Deer Park, Lower Arrow Lake, Columbia River, B.C. (*Macoun.*)

(263.) **C. depilata,** Kindb.

G. densa, Kindb., Bull. Torr. Bot. Club, XVII., 271.

Tufts large and compact, brown or green above. Stem elongate. Leaves, when moist arcuate, ovate-lanceolate (shorter than in *G. trichophylla*), recurved on both sides, generally hairless and obtuse, sometimes with a short hair-point; alar cells hyaline elongate in 4-5 rows, the other more or less erose. Perichetial leaves from the sheathing base narrowed into a longer, canaliculate, sublinear (not subulate) and obtuse acumen. Capsule nearly smooth, when dry finally rugose, not distinctly costate; teeth red, deeply cleft below the middle, when dry, spreading, connivent when moist; beak more or less oblique; pedicel arcuate when dry.

This species is nearly allied to *Grimmia trichophylla* and very critical but is approved of by Dr. C. Mueller.

Summit of Mount Benson, near Nanaimo, Vancouver Island, alt. 3,000 feet; June 8th, 1887. (*Macoun.*)

(264.) **C. Olneyi,** Sulliv.; Lesq. & James, Mosses of N. America, 142.

On boulders along the St. Lawrence at Brockville; on Laurentian rocks, Gibson's Mountain, Prince Edward Co., Ont. (*Macoun.*)

(265.) **C. arcuatifolia,** Kindb., Bull. Torr. Bot. Club, XVI., 93.

Loosely tufted; tufts blackish, dark green above. Stems 5 cm. long, denudate at base. Lower leaves small, upper long and not crisped; hooked-curved when moist, ovate-lanceolate, long-acuminate and acute, reflexed at least at one border with a short denticulate hair-point; most of the basal cells pellucid, long and narrow, the upper basal cells sinuous, the marginal uniseriate and hyaline or not distinct;

the other cells chlorophyllous, quadrate and not sinuous; costa percurrent canaliculate, pellucid in the middle.

Probably allied to the European *Grimmia elatior*, Bryol, Europ., but this species has also the upper cells sinuous.

Abundant on dry rocks, Cedar Hill and Mount Tolmie, near Victoria, Vancouver Island, April 21st, 1887. (*Macoun.*)

(266.) **G. microtricha,** C. M. & Kindb. (n. sp.)

Plants in small blackish pulvinate tufts with green tops. Leaves, when moist, suberect, short ovate-lanceolate, margins recurved, plane only at the short base; cells short, the alar narrow and hyaline. Perichetial leaves ovate obtuse. Capsule oblong, smooth; teeth dark red; annulus not distinct; lid short conic, obtuse; calyptra narrow, dimidiate; pedicel flexuous, about 3 mm. long. Dicœcious or monœcious on distinct branches.

Differs from the allied *Grimmia alpestris* principally in the longer emergent capsule, the recurved leaf-margins and the short perichetial leaves.

On rocks north of the railway close to Revelstoke, B.C., May 7th, 1890. (*Macoun.*)

(267.) **G. alpestris,** Schleich.; Lesq. & James, Mosses of N. America, 146; Canadian Musci, No. 414.

Summit of Mount Albert, Gaspé Co., Que.; also along the Blackwater River, B.C., 1875. (*Macoun.*)

(268.) **G. sulcata,** Saut.; Flora of Greenland, 348.

Franz Joseph Fjord (sterile.) (*Fl. Gr.*)

(269.) **G. Donniana,** Smith; Lesq. & James, Mosses of N. America, 142.

On dry rocks, Cypress Hills, Alberta. August 2nd, 1880. (*Macoun.*)

(270.) **G. ovata,** Web. & Mohr; Lesq. & James, Mosses of N. America, 143; Drumm. Musc. Bor.-Am., No. 59.

G. commutata, Canadian Musci, No. 94, in part.

From Lake Superior to the Rocky Mountains. (*Drummond.*) On rocks, River Ste. Anne des Monts, Gaspé Co., Que; on rocks at Thunder Bay, Lake Superior, and at the outlet of Nepigon Lake, Ont.; also on rocks at Peace River, lat. 56° 12′. (*Macoun.*) Greenland. (*Fl. Gr.*)

(271.) **C. Pennsylvanica,** Schwaegr ; Lesq. & James, Mosses of N. America, 144 ; Drumm. Musc. Bor.-Am., No. 56.

Upon rocks, near the Falls of Niagara. (*Drummond.*)

(272.) **C. calyptrata,** Hook. ; Lesq. & James, Mosses of N. America, 144 ; Canadian Musci, No. 472 ; Drumm. Musc. Bor.-Am. No. 60.

Rocks amongst the Rocky Mountains. (*Drummond.*) On rocks at the " Gap," and 3 miles below Hector, Rocky Mountains ; dry rocks Deer Park, Lower Arrow Lake, Columbia River ; on dry rocks at Kamloops, and on mountains at Spence's Bridge and Blackwater River, B.C. (*Macoun.*)

(273.) **C. commutata,** Hueben. ; Lesq. & James, Mosses of N. America, 145 ; Canadian Musci, No. 94, in part.

On dry rocks at Sicamous, B.C., 1889 ; and on rocks at Deer Park, Lower Arrow Lake, and Sproat, Columbia River, B.C. 1890. (*Macoun.*)

(274.) **C. montana,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 145 ; Canadian Musci, No. 509.

On Kettle River, B.C. (*Watson.*) On dry rocks at Deer Park Lower Arrow Lake, Columbia River, B.C. 1890. (*Macoun.*)

(275.) **C. mollis,** Bryol. Europ. III. Tab., 253 ; Flora of Greenland, 348.

Greenland. (*Fl. Gr.*)

(276.) **C. elongata,** Kaulf. ; Braithw. British Moss-Flora, Vol. II., 30.

Dicœcious. Tufts lax, pulvinate, fuscous or black below, olivaceous, green, and shortly canescent. Leaves elongate-lanceolate from an erect, oblong base, slightly recurved at the margins ; basal cells narrow, upper quadrate, sinuose ; costa excurrent. Capsule exserted on a short, nearly straight, yellowish pedicel, small, ovate, smooth, pale-fuscescent ; lid conic-obtuse ; annulus double or triple ; calyptra cucullate, lobate, teeth yellow.
Greenland. (*Fl. Gr.*)

(277.) **C. unicolor,** Grev. ; Lesq. & James, Mosses of N. America, 146 ; Canadian Musci, No. 95.

G. atrata, Drumm. Musc. Bor.-Am., No. 57.

Upon rocks, Lake Superior. (*Drummond.*) On rocks, north shore

of Lake Superior and at Current River, Thunder Bay; also on rocks by the shores of Lake Nepigon. (*Macoun.*) Nepigon River, Lake Superior. (*A. Smith.*)

45. RACOMITRIUM, Brid.

(278.) **R. patens,** Heuben.; Lesq. & James, Mosses of N. America, 147; Canadian Musci, No. 96.

Trichostomum patens, Drumm. Musc. Bor.-Am., No. 131.
Grimmia patens, Mitt. Journ. Linn. Soc. VIII. 20.

Upon rocks near the "Height of Land," Rocky Mountains. (*Drummond.*) On rocks at the mouth of Illicillewaet Cañon near Revelstoke; along Pass Creek at Sproat; wet rocks, Lake Mara, Sicamous, B.C.; summit of Mount Benson near Nanaimo, Vancouver Island. (*Macoun.*) Between Fort Colville and the Rocky Mountains. (*Lyall.*) Greenland. (*Fl. Gr.*)

(279.) **R. aciculare,** Brid.; Lesq. & James, Mosses of N. America, 148; Canadian Musci, No. 97.

Trichostomum aciculare, Drumm. Musc. Bor.-Am., No. 133.
Grimmia acicularis, Mitt. Journ. Linn. Soc. VIII., 20.

On stones in rivulets, to the westward of the "Height of Land," Rocky Mountains. (*Drummond.*) Halifax Co., N.S. (*McKay.*) On stones in small brooks around Halifax and Truro, N.S.; in a brook north of Lake Superior; on rocks in the Columbia River above Revelstoke, in Eagle River at Griffin Lake, on rocks Lake Mara, Sicamous; common in the Fraser River at Yale; wet rocks at Agassiz and Burrard Inlet at Hastings, B.C. (*Macoun.*) On stones, New Harbor, Chance Cove and Green Harbor, Newfoundland. (*Rev. A. Waghorne.*) British Columbia. (*Lyall, Douglas.*) Sitka. (*Roth. Alask.*) Miquelon Island. (*Delàmare.*)

(280.) **R. Nevii,** C. Muell.; Lesq. & James, Mosses of N. America, 148; Canadian Musci, No. 485.

On rocks at Hot Springs, Kootanie Lake; abundant on rocks at Revelstoke close to the big eddy west side of the Columbia River; on rocks in the bed of the Fraser River at Yale, and at Lake Mara, Sicamous, B.C.; on stones in a brook at Truro, N.S. (*Macoun.*)

(281.) **R. protensum,** Braun, (Mss.) Hueben, Musc. Germ. 211. (1833.)

On rocks near Oak Bay, Victoria, Vancouver Island, 1875. (*Macoun.*) Greenland. (*Fl. Gr.*)

(282.) **R. Macounii,** Kindb., Bull. Torr. Bot. Club, XVI., 93; Canadian Musci, No. 418.

Plants fastigiately branching; innovations without lateral fasciculate branchlets. Tufts loosely cæspitose, naked at the base, brown, with green tips. Leaves loose, crispate when dry, patent or squarrose when moist, ovate-lanceolate, acute, muticous, smooth and entire, at one side slightly reflexed or erect, on the other always erect; upper cells quadrate and obscure, scarcely or not erose, lower linear and sinuose, marginal uniseriate, quadrate-rectangular and hyaline, basal yellow; costa brown and percurrent. Capsule oblong, dark-brown, not striate; teeth orange, pertuse or cleft to below the middle, smooth; pedicel 0·5 c.m. long, straight or sub-erect and contorquate.

In large masses on huge boulders between Cathedral Mountain and Mount Stephen near Field, Rocky Mountains; also on rocks near the Glacier Hotel, Selkirk Mountains; on the summit of the Gold Range, north of Griffin Lake, B.C., alt. 7,000 feet. (*Macoun.*)

(283.) **R. alternuatum,** C. M. & Kindb.; Canadian Musci, No. 524.

Allied to *R. Macounii.* Stem lower, 3-4 cm. high, more branched above. Tufts loose, not naked at the base, brown with green tips. Leaves not crisped, when moist suberect or subpatent, nearly straight, ovate-lanceolate, acuminate-acute, often furnished with a short dentate hair point, smooth, reflexed at the base at least on one side; all cells erose, the lower linear, the upper short, angular; costa greenish, stout, percurrent. Perigonial leaves subovate or short-acuminate, acute or subobtuse. Female plants not found.

On boulders at the base of Avalanche Mountain, Roger's Pass, Selkirk Mountains, B.C., Aug. 5th, 1890. (*Macoun.*)

(284.) **R. robustifolium,** Kindb., Bull. Torr. Bot. Club, XVII., 272.

R. obscurum, Kindb.; Canadian Musci, No. 419.

Differs from *R. Macounii* in the leaves being less crispate, (very variable in color, sometimes dark green) pellucid, very squarrose when moist, more reflexed on the borders, often furnished with a short hair-point. Capsule oval, striate or plicate when dry; teeth dark purple-brown, deeper cleft, papillose; the beak of the lid oblique, needle-shaped, very much shorter than the capsule; pedicel slightly curved.

Both these species differ from *R. varium* and *R. Oreganum* in the short pedicel and longer leaves. On rocks in a brook, Gold Range, north of Griffin Lake, B.C., alt. 7,000 feet; Mount Arrowsmith, Vancouver Island, alt. 5,700 feet. July 17th, 1887. (*Macoun.*)

(285.) **R. Sudeticum,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 149; Canadian Musci, No. 98, in part.

Trichostomum Sudeticum, Drumm. Musc. Bor.-Am. No. 129.

On rocks near the "Height of Land," Rocky Mountains. (*Drummond.*) On earth among rocks at Truro, N.S.; on rocks at the Asulcan Glacier and Roger's Pass, Selkirk Mountains. (*Macoun.*) On rocks, Mount Queest, Gold Range, B.C., alt. 6,000 feet. (*J. M. Macoun.*) On rocks at New Harbor and Chance Cove, Newfoundland. (*Rev. A. Waghorne.*) Greenland. (*Fl. Gr.*)

(286.) **R. heterostichum,** Brid.; Lesq. & James, Mosses of N. America, 149; Canadian Musci, No. 99.

On rocks at the base of Avalanche Mountain, Roger's Pass, Selkirk Mountains; dry rocks at Revelstoke, on the Columbia River; Deer Park, Lower Arrow Lake, and along Pass Creek at Sproat; on rocks at Sicamous, at Yale and Spence's Bridge, also at Hastings, B.C.; very common on rocks around Victoria, and on Mount Arrowsmith, Vancouver Island. (*Macoun.*) Greenland. (*Fl. Gr.*)

(287.) **R. obtusum,** (Smith) Lindb.; Braithw. British Moss-Flora, Vol. II., 40.

R. Sudeticum, Canadian Musci, No. 98, in part.

Dicœcious; short, densely pulvinate. Leaves quite hairless, ovate-oblong, gradually acuminate, obtuse at the point, nerve lost far below the apex, margin narrowly revolute. Capsule oblong, narrowed at the mouth, lid acicular, peristome fugacious, irregular, teeth with 2 unequal legs.

On rocks near Otter Head, Lake Superior, July 28th, 1869. (*Macoun.*)

(288.) **R. affine,** (Schleich.) Lindb.; Braithw. British Moss-Flora, Vol. II., 41; Canadian Musci, No. 499.

Dicœcious; yellowish green, scarcely hoary. Stems slender, elongate, fasciculate-branched. Leaves lanceolate-acuminate, acute with a short or obsolete hair-point. Capsule elliptic-oblong, narrow at mouth; lid conico-rostrate; teeth short, pale, cleft to the base; pedicel short.

On dry rocks, North West Arm, Halifax, N.S., June 19th, 1883; on rocks in Roger's Pass, at the base of Avalanche Mountain, Selkirk Mountains; and near McLeod's Lake, B.C. (*Macoun.*)

(289.) **R. fasciculare,** Brid.; Lesq. & James, Mosses of N. America, 150; Canadian Musci, No. 416.

Trichostomum fasciculare, Drumm. Musc. Bor.-Am., No. 132.

About Lake Superior; and upon the rocks of Portage River, Rocky Mountains. (*Drummond.*) On rocks in McDonald's Brook, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On rocks along Lake Superior and on islands in Lake Nepigon; on rocks, Roger's Pass, Selkirk Mountains, at Revelstoke on the Columbia River, at Deer Park, Lower Arrow Lake, and at Hastings, B.C. (*Macoun.*) On rocks, Queen Charlotte Islands. (*Dawson.*) On rocks at New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Alaska. (*Roth. Alask.*) Jakobshavn, Greenland. (*Fl. Gr.*) Miquelon Island. (*Delàmare.*)

(290.) **R. varium,** Lesq. & James, Mosses of N. America, 150.

R. heterostichum, var. *obtusum,* Kindb.; Canadian Musci, No. 100.
Grimmia varia, Mitt. Journ. Linn. Soc. VIII., 21.

On wet rocks, close to the water below the railway bridge over the Nanaimo River, Vancouver Island, 27th April, 1887. (*Macoun.*) British Columbia. (*Lyall, Douglas.*)

(291.) **R. Oreganum,** Ren. & Cardt., Bot. Gaz. XIII., 198.

R. varium, Canadian Musci, No. 104.

Robust, in wide yellowish tufts. Stems prostrate and a little naked below; branches erect, 4-5 cm. long, simple or dichotomous, and with very few short branchlets. Leaves appressed when dry, erect-spreading when moist, generally more or less homomallus at the top of the branches, ovate, or broadly ovate-lanceolate, acuminate, carinate, slightly plicate below, sometimes obtuse, generally acute, muticous or with a short hyaline apiculus or a more or less elongated, shortly decurrent, slightly serrulate hair-point; borders revolute from the base to near the apex; costa percurrent, prominent on the back; cells thick-walled, linear, very sinuose, the lower mostly elongate, the upper 2-4 times longer than broad, slightly papillose. External perichetial leaves shortly piliferous, the inner muticous, of a more delicate texture of thin-walled and scarcely sinuose cells. Pedicel reddish, paler above, twisted to the left, 12-18 mm. long, 1 mm. broad; lid long-beaked; annulus large; teeth purple, very long, cleft to the base into two filiform, often unequal, nodulose and faintly papillose legs; calyptra conical, long-acuminate, brownish at apex, laciniate-lobulate at base.

A remarkable species intermediate between *R. canescens* and *R. heterostichum*, but more closely allied to the last, from which it differs by the aspect, the yellowish color, the robustness and thickness of the stems, the pedicel twice longer and the teeth much more elongated.

On loose boulders in woods near McLeod's Lake, Northern British Columbia ; on rocks, Mount Tolmie, near Victoria, Vancouver Island ; common on loose boulders at Yale, B.C., May 17th, 1875. (*Macoun.*) On rocks, Texada Island, Gulf of Georgia, B.C. (*Dawson.*)

(292.) **R. speciosum,** C. Muell. (n. sp.)

Found on Vancouver Island by Dr. S. Rœll in 1888. This species was found by me at Victoria in 1875, and named by Austin *R. lanuginosum*, and also *R. canescens* var. *ericoides*. It was collected again on April 26th, 1887, and named by Dr. Kindberg *R. heterostichum*. It is very common on the rocks in oak woods around Victoria. Fruiting abundantly. (*Macoun.*)

(293.) **R. microcarpum,** Brid. ; Lesq. & James, Mosses of N. America, 150 ; Canadian Musci, No. 101.

Trichostomum microcarpum, Drumm. Musc. Bor.-Am., No. 128.

Upon rocks, shore of Lake Superior. (*Drummond.*) Dry rocks, North West Arm, Halifax, N.S. ; on rocks, Mount Albert, Gaspé Co., Que. ; on rocks, 25 miles north of Michipicotin, Lake Superior ; dry rocks, Nepigon River, and along the lake ; on earth on stones, Asulcan Glacier, Selkirk Mountains. (*Macoun.*) Skeena River, B.C. (*J. M. Macoun.*) Godhavn, Greenland. (*Fl. Gr.*)

(294.) **R. lanuginosum,** Brid. ; Lesq. & James, Mosses of N. America, 151 ; Canadian Musci, No. 102.

Trichostomum lanuginosum, Drumm. Musc. Bor.-Am., No. 134.
Grimmia lanuginosa, Mitt. Journ. Linn. Soc. VIII., 21.

Miquelon Island. (*Delàmare*). Upon a rock near the " Height of Land," Rocky Mountains, very rare, only a single patch being seen. (*Drummond.*) Nottingham Island and North Bluff, Hudson Strait. (*R. Bell.*) Halifax Co., N.S. (*McKay.*) On rocks at Louisburg, Cape Breton Island ; summit of Mount Albert, Gaspé Co., Que. ; Mount Aylmer, Rocky Mountains, 8,000 feet alt. (*Macoun.*) Vancouver Island. (*Wood.*) Kotzebue Sound. (*Roth. Alask.*). St. Paul Island, Behring Sea. 1891. (*J. M. Macoun.*) Baffin's Bay. (*Ross, Voy.*) Smith's Sound. (*Dr. Kane.*) Smith's Sound, between lat. 78° —82°. (*Dr. Hayes.*) Shannon Island, Greenland. (*Fl. Gr.*)

(295.) **R. canescens,** Brid.; Lesq. & James, Mosses of N. America, 151; Canadian Musci, No. 103.

Grimmia canescens, Mitt. Journ. Linn. Soc. VIII., 21.

Miquelon Island. (*Delàmare.*) Digge's Island, Hudson Strait.—(*R. Bell.*) On sand a few miles up St. Anne des Monts River, Gaspé Co., Que.; on rocks, north shore of Lake Superior; and at Point aux Pins, near Sault Ste. Marie; limestone rocks at Hector and Mount Aylmer, Rocky Mountains; on rocks, Roger's Pass, Selkirk Mountains; common on rocks and sand at Revelstoke, and on rocks, Pass Creek, at Sproat, Columbia River, B.C. (*Macoun.*) Vancouver Island. (*Lyall.*) Ounalaska Island, Behring Sea. 1891. (*J. M. Macoun.*) Godhavn, Greenland. (*Fl. Gr.*) Chance Cove, Newfoundland. (*Rev. A. Waghorne.*)

Var. **ericoides,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 151; Canadian Musci, No. 417.

On rocks and silt, Asulcan Glacier, Selkirk Mountains; on rocks, North Arm, and at Hastings, Burrard Inlet, B.C. (*Macoun.*) Sitka. (*Roth. Alask.*) On rocks in Stanley Park, Vancouver, B.C. (*A. Law.*)

Var. **lutescens,** Lesq. & James, Mosses of N. America, 151.

On rocks at Moodyville, Burrard Inlet, B.C., 1889. (*Macoun.*)

Var. **muticum,** Kindb., Bull. Torr. Bot. Club XVII., 272.

Leaves without a hair-point; cells yellow; costa percurrent. Barren. On rocks, summit of Gold Range, north of Griffin Lake, B.C.; alt. 7,000 feet. August 8th, 1889. (*Macoun.*)

(296.) **R. micropus,** Kindb.

R. brevipes, Kindb., Bull. Torr. Bot. Club, XVII., 272.

Habit of *R. heterostichum* or *R. canescens.* Plants dirty green; branches nodose with numerous short branchlets. Leaves very faintly papillose, ovate lanceolate, long-acuminate, more or less revolute, hair-point long and rough; cells yellow, the upper short or elongate, the alar distinctly quadrate. Capsule small oblong-cylindrical with a short oblique beak; pedicel short, 0.5 cm. long. Peristome not examined.

On sloping garnetiferous rocks near the summit of the Gold Range, north of Griffin Lake, B.C. Alt. 6,700 feet. August 8th, 1889; also on rocks three miles below Hector, Rocky Mountains. (*Macoun.*)

46. HEDWIGIA, Ehrh.

(297.) **H. ciliata,** Ehrh.; Lesq. & James, Mosses of N. America, 152; Canadian Musci, No. 106.

Anictangium ciliatum, Drumm. Musc. Bor.-Am., No. 29.

Rocks in the country extending from Lake Superior to the Rocky Mountains. (*Drummond.*) On rocks, New Harbor, Newfoundland. (*Rev. A. Waghorne.*) On rocks, Kent Co., N.B. (*Fowler's Cat.*) Tay, York Co., and Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On boulders at Ottawa and Belleville, Ont.; on rocks at Hector, Kicking Horse Lake, and Banff, Rocky Mountains; also at Revelstoke, Columbia River, B.C. Common from the Atlantic to the Pacific in one form or another. (*Macoun.*) On rocks at London, Ont. (*J. Dearness.*) Mooyie River, British Columbia. (*Lyall.*) Greenland. (*Fl. Gr.*)

Var. **leucophæa,** Schimp.; Canadian Musci, No. 107.

This is the common form on the Pacific Coast and Coast Range. Quesnel, Hastings, Moodyville, and Salt Spring Island, B.C.; common on rocks around Victoria, Vancouver Island. (*Macoun.*)

Var. **secunda,** Schimp.

On rocks, at Sudbury Junction; and around Lake Nepigon, Ont. (*Macoun.*)

Var. **viridis,** Schimp.; Canadian Musci, No. 108.

Anictangium imberbe, Drumm. Musc. Bor.-Am. No. 30.

Very common in Ontario on boulders in shady woods. On rocks, North West Arm, Halifax, N S.; common at Ottawa and Belleville, Ont.; also at Manitoba House, Lake Manitoba. (*Macoun.*) Montcalm Co., Que. (*D'Urban.*) Tadousac, Que. (*St. Cyr.*) Upper Canada. (*Drummond.*) On rocks in woods near London, Ont. (*J. Dearness.*)

*H. **subnuda,** Kindb. (n. subsp.)

Leaves nearly hairless, the greater number broadly ovate, borders reflexed; cells larger, subquadrate.

On rocks in McKay's Woods at Ottawa; also on boulders, in woods, near Wooler, Ont., Oct. 6th, 1888. (*Macoun.*)

47. BRAUNIA, Bruch & Schimp.

(298.) **B. Californica,** Lesq.; Lesq. & James, Mosses of N. America, 153: Canadian Musci, No. 109, in part.

Hedwigia pilifera, Mitt. Journ. Linn. Soc. VIII. 45.

Abundant on rocks, North Arm of Burrard Inlet, B.C.; quite common on rocks around Victoria, Vancouver Island. (*Macoun.*)

Var. **pilifera,** Lesq. & James Mosses of N. America, 153. Canadian Musci, No. 109 in part.

Abundant on rocks in oak woods near Victoria, Vancouver Island (*Macoun.*) On rocks, Vancouver Island. (*Lyall.*)

IX. ORTHOTRICHEÆ.

48. COSCINODON, Sprengel.

(299.) **C. pulvinatus,** Spreng.; Lesq. & James, Mosses of N. America, 154.

On rocks, Alaska. (*Harrington.*) On rocks along the Telegraph Trail, north of Blackwater River, B.C. (*Macoun.*) Mountain rocks in alpine situations. (*Drummond.*)

49. PTYCHOMITRIUM, Bruch & Schimp.

(300,) **P. Gardneri,** Lesq.; Lesq. & James, Mosses of N. America, 156.

On rocks along the most western brook at Deer Park, Lower Arrow Lake, B.C. (*Macoun.*)

(301.) **P. incurvum,** Sulliv.; Lesq. & James, Mosses of N. America, 157.

Grimmia Hookeri, Drumm. Musc. Bor.-Am., No. 61.

On a stone near the Falls of Niagara, in Ontario; rare. (*Drummond.*)

50. CLYPHOMITRIUM, Brid.

(302.) **C. Canadense,** Mitt.; Lesq. & James, Mosses of N. America, 158; Mitt. Journ. Linn. Soc. VIII., 21.

British North America. (*Drummond.*)

51. ZYGODON, Hook. & Tayl.

(303.) **Z. viridissimus,** (Dicks.) R. Brown.

Gymnostomum viridissimum, Drumm. Musc. Bor.-Am., No. 27.

White Falls, between Norway House and Hudson Bay at York Factory. (*Drummond.*)

52. AMPHORIDIUM, Schimp.

(304.) **A. Lapponicum,** Schimp.; Lesq. & James, Mosses of N. America, 158; Canadian Musci, No. 110.

Gymnostomum Lapponicum, Drumm. Musc. Bor.-Am., No. 28.
Didymodon Lapponicus, Mitt. Journ. Linn. Soc. VIII. 18.

Rocks of Lake Superior, and upon the Rocky Mountains; common (No. 28). (*Drummond.*) Truro, N.S. (*Fowler's Cat.*) Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On rocks, Pirate's Cove, N.S.; along the Jupiter River, Anticosti; common at the Falls of Fox River, Gaspé Co., Que.; crevices of rocks 10 miles south of Port Arthur, Thunder Bay, Lake Superior; abundant on rocky islands in Lake Nepigon; on rocks, at Hector and Banff, Rocky Mountains, and in Roger's Pass, Selkirk Mountains, B.C. (*Macoun.*) Cascade Mountains. (*Lyall.*) Disco and Holsteinburg, Greenland. (*Fl. Gr.*) On rocks at Tadousac, Que. (*St. Cyr.*)

(305.) **A. Mougeotii,** Schimp.; Lesq. & James, Mosses of N. America, 159; Canadian Musci, No. 420.

On rocks near the tunnel 5 miles below Hector, Rocky Mountains; on wet rocks, Pass Creek Falls at Sproat; on rocks on the Columbia River above Revelstoke and in Eagle Pass west of Revelstoke; at Sicamous and Agassiz, B.C.; Mount Benson, near Nanaimo, Vancouver Island; also Mount Erskine, Salt Spring Island, Gulf of Georgia. (*Macoun.*)

(306.) **A. Californicum,** Lesq. & James, Mosses of N. America, 159.

A. Sullivantii, Canadian Musci No. 111.

Near the British Columbian Boundary. (*Lyall.*) On rocks at Yale, B.C., and on rocks near Mount Tolmie, Victoria and at the Nanaimo River, Vancouver Island. (*Macoun.*)

(307.) **A. cæspitosum,** Lesq. & James, Mosses of N. America, 160.

Didymodon cæspitosus, Mitt. Journ. Linn. Soc. VIII, 18.

Vancouver Island. (*Lyall.*) On rocks near Oak Bay, Victoria, Vancouver Island, and on Mount Erskine, Salt Spring Island, Gulf of Georgia, B.C. (*Macoun.*)

53. DRUMMONDIA, Hook.

(308.) **D. clavellata,** Hook.; Lesq. & James, Mosses of N. America, 160; Canadian Musci, No. 525; Drumm. Musc. Bor.-Am. No. 62.

On trees, Upper Canada (Ontario.) (*Drummond.*) On trees in the thick woods at Owen Sound, and in woods at Port Dover, Ont. (*Macoun.*)

Var. **Canadensis,** Kindb. (n. var.)

Differs in the leaves being larger and longer, also in the monœcious inflorescence.

On trees, Pelee Island, Lake Erie, June 16th, 1882. (*Macoun.*)

54. ULOTA, Mohr.

(309.) **U. Drummondii,** Brid.; Lesq. & James, Mosses of N. America, 161.

Canada. (*Drummond.*) Miquelon Island. (*Delàmare.*) On trees at New Harbor and Shoal Harbor, Newfoundland. (*Rev. A. Waghorne.*)

(310.) **U. Ludwigii,** Brid.; Lesq. & James, Mosses of N. America, 161; Canadian Musci, No. 112.

Orthotrichum Ludwigii, Drumm. Musc. Bor.-Am. No. 146.

Upon trees about Lake Superior. (*Drummond.*) Pictou, N.S. (*McKay.*) On trees, Bass River, Fredericton and Grand Lake, N.B. (*Fowler's Cat.*) On trees, Tobique River, N.B. (*Hay.*) On trees, Tay, York Co. and Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On trees at Whycocogmah, Cape Breton; Jupiter River, Anticosti; and along Ste. Anne des Monts River, Gaspé Co., Que.; on trees, Rustico Bay, P.E.I.; on trees, Sudbury Junction and at Elliott's Falls, Victoria Co., Ont. (*Macoun.*) On trees at New Harbor, Topsail and Blaketown, Newfoundland. (*Rev. A. Waghorne.*)

(311.) **U. curvifolia,** Brid.; Lesq. & James, Mosses of N. America, 161.

Canada. (*Drummond* fide *Schimp.*) Shore of Lake Huron opposite the Fishing Islands, Bruce Co., Ont. (*Macoun.*) Greenland. (*Fl. Gr.*)

(312.) **U. Bruchii,** Hornsch.; Lesq. & James, Mosses of N. America, 162; Canadian Musci, No. 453, in part.

On leaning trees by a brook a little above Port Dover, Lake Erie, Ont. (*Macoun.*) Upper Canada (Ontario.) (*Drummond.*) On small trees at Coquhilla River near New Westminster Junction, B.C. (*Macoun.*) New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

(313.) **U. obtusiuscula,** C. M. & Kindb., (n. sp.); Canadian Musci, No. 523.

U. Bruchii, Canadian Musci, No. 453, in part.

Nearly allied to *Ulota Bruchii*, differing principally in the leaves being less narrowed sub-obtuse, also in the longer collum of the wide-mouthed, not constricted capsule.

On small maple trees in thickets along the Coquhilla River near New Westminster Junction, B.C., April 26th, 1889. (*Macoun.*) On trees near Fort Rupert, Vancouver Island, 1885. (*Dawson.*)

(314.) **U. subulata,** C. M. & Kindb., (n. sp.)

Tufts small, stem slender, sparingly short-branching, when dry subjulaceous. Leaves small, when moist squarrose, patent, very papillose, from a perfectly ventricose base narrowed into the subulate-piliform acumen, flexuous, erect at the margins; costa very thin, rufescent, vanishing in the acumen; cells uniform, comparatively large and incrassate. Capsule small, cylindric-clavate; lid apiculate; pedicel long.

This species has nearly the habit of *Macrocoma*, a section of the genus *Macromitrium*, C. Mueller.

On small trees in thickets, Black's Farm, along the Coquhilla River, near New Westminster Junction, B. C., April 26th, 1889. (*Macoun.*)

(315.) **U. subulifolia,** C. M. & Kindb., (n. sp.)

Differs from *Ulota subulata* in the stem being more branched, the leaves when dry twisted or subcrisped, sparingly papillose, revolute at the basal margin at least at one side; lower basal cells elongate,

alar indistinct; capsule very small, short-obovate, costate, finally sub-cylindric; pedicel not very long; calyptra nearly naked.

On small trees in thickets, Black's Farm, along the Coquhilla River, near New Westminster Junction, B. C., April 26th, 1889. (*Macoun.*)

(316.) **U. scabrida,** Kindb., (n. sp.)

U. Americana, Canadian Musci, No. 115.

Tufts large and dense, blackish brown below, green or dark green above. Stem much divided. Leaves crisped when dry, squarrose-falcate when moist, very papillose and opaque, revolute from the base to the middle, comparatively short (as in *U. curvifolia*), from an enlarged base suddenly sublinear, nearly obtuse; basal cells elongate, alar or marginal distinct and hyaline. Capsule sub-oblong, passing into the long collum; teeth not reflexed, pale; calyptra very hairy, lobate; pedicel long.

This fine species resembles *U. crispa* more than *U. curvifolia*, and is not much allied to the last. The true *Ulota curvifolia* has the leaves straight and erect-patent when moist, and faintly twisted when dry.

Abundant on immense boulders between Cathedral Mountain and Mount Stephen three miles below Hector, Rocky Mountains, July 29th, 1885; also in the same place and on boulders by the torrent at Hector, Aug., 1890. (*Macoun.*)

(317.) **U. Americana,** Mitt.; Lesq. & James, Mosses of N. America, 162; Mitt. Journ. Linn. Soc. VIII., 26.

U. Hutchinsiæ, Schimp.; Canadian Musci, No. 117.
Orthotrichum Hutchinsiæ, Drumm. Musc. Bor.-Am. No. 147.

On rocks at Bass River, Kent Co., N.B. (*Fowler's Cat.*) On rocks at Truro, N.S.; and at Madeline River, Gaspé Co., Que.; quite common on rocks along the north shore of Lake Superior, especially above Michipicotin. (*Macoun.*) Upon rocks, rarely on trees, Lake Superior. (*Drummond.*) Pictou, N.S. (*McKay.*) Lake Huron. (*Dr. Todd.*) British America. (*Drummond*, No. 153), with *U. Bruchii* and *U. crispa*. (*Mitten.*) Lindberg makes out No. 153 to be *U. crispa* var. *minor*, Lesq. & James which these authors make theirs to be. The following copy of Drummond's ticket may throw some light on the seeming difficulty. "On trees in Upper Canada, and upon rocks called Hell's Gate, below Norway House" (on Hay's River). It is extremely probable that Drummond's No. 153 that fell into the hands of Mr. Mitten had a specimen gathered at "Hell's Gate," and which he named *U. Americana*, the other being as Lesq. & James, say *U. crispa* var. *minor*. I have never observed a species of *Ulota* that

grew indiscriminately on rocks and trees, and therefore, propose to place *U. Americana* at "Hell's Gate," and hence a rock species.

(318.) **U. crispa,** Brid.; Lesq. & James, Mosses of N. America, 162; Canadian Musci, No. 113, in part.

On trees, Tay Forks, York Co., and Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On trees along the Tobique River, N.B. (*Hay.*) On trees, Bass River, Kent Co., also at Fredericton and Grand Lake, N.B. (*Fowler's Cat.*) On trees at Pirate's Cove and Truro, N.S.; along the Gaspé coast, Que.; and frequent on trees in Hastings and Addington counties, Ont. (*Macoun.*) Very common on trees at New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Pictou, N.S. (*McKay.*)

(319.) **U. intermedia,** Schimp. Syn. (ed. II.) 305 ?

U. crispa var. *minor*, Lesq. & James, Mosses of N. America, 162.
U. crispa, Canadian Musci, No. 113, in part.
Orthotrichum crispum, Drumm. Musc. Bor.-Am. No. 153, in part.

On trees in Upper Canada (Ontario). (*Drummond.*) On trees near Belleville, Hastings Co., Ont. (*Macoun.*) Miquelon Island. (*Delàmare.*)

(320.) **U. crispula,** Brid.; Lesq. & James, Mosses of N. America, 163; Canadian Musci, No. 114.

On trees at New Harbor, Newfoundland. (*Rev. A. Waghorne.*) On trees along Jupiter River, Anticosti; also along the Ste. Anne des Monts River, Gaspé Co., Que.; at Sudbury Junction, abundant on trees in Hastings and Northumberland counties, and Owen Sound, Ont. (*Macoun.*) On beech trees, Bass River, Kent Co., N.B. (*Fowler's Cat.*) On trees, Tay, York Co., and Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Pictou, N.S. (*McKay.*)

(321.) **U. phyllantha,** Brid.; Lesq. & James, Mosses of N. America, 163; Canadian Musci, No. 116, in part.

On the bases of trees at Louisburg, Cape Breton Island; at Yarmouth, N.S. (*Macoun.*) Miquelon Island. (*Delàmare.*)

(322.) **U. maritima,** C. M. & Kindb. (n. sp.)

U. phyllantha, Mitt. Journ. Linn. Soc. VIII., 26; Canadian Musci, No. 116, in part.

Differs from *Ulota phyllantha.*, Brid., in the short oval capsule, with a short collum, the pedicel shorter and thicker, curved when moist,

the leaves long, attenuate to the subulate apex, distinctly papillose, the costa narrower, rough at back.

This species differs from the preceding species in the curved pedicel of the capsule; it has not hitherto been found fruiting in Europe. The allied *Ulota phyllantha* has the leaves nearly sublinear above the middle, short-acuminate and obtuse, faintly papillose, the costa smooth at back, the capsule longer with a long collum and a long, fine and straight pedicel; it grows, probably, always on trees; *U. maritima* is only found on rocks near the sea; also in Sweden, &c.

On rocks surrounded by the tide at Hastings, B.C.; also on rocks close to the sea at Vesuvius Bay, Salt Spring Island, Gulf of Georgia, May 9th. 1887; and at Comox, Vancouver Island, April 30th, 1887. (*Macoun*) On rocks, Texada Island, B.C. 1885. (*Dawson.*) Ounalaska Island, Behring Sea and Kadiak, Island, Alaska. 1891. (*J. M. Macoun.*) Miquelon Island. (*Delàmare.*)

(323.) **U. camptopoda,** Kindb. (n. sp.); Canadian Musci, No. 582.

Stem not creeping. Leaves, when dry, crisped, when moist patent or squarrose, often curved, faintly papillose, from a short dilated ventricose base, suddenly narrowed into the acute or subulate acumen, borders recurved at the base, and also often above on one side; outer basal cells, disposed in 2-5 rows, quadrate-rectangular thick-walled, inner narrow, orange, upper rotundate; costa elevate, stout percurrent. Capsule small, long-necked, when dry faintly plicate, narrow, subcylindric and not constricted below the mouth, obovate when moist; teeth bigerminate, pale, when dry recurved; cilia none; lid long-apiculate; pedicel long, but not much emergent, flexible, more or less curved or geniculate, in younger as well as in the dry state; calyptra densely hairy, covering the capsule.

Habit of *U. crispula.* Agrees with *U. maritima* in the curved pedicel; differs from *U. Ludwigii* in the narrower capsule. Growing together with *U. Ludwigii* on trees along the creek north of the tollgate on the Aylmer Road near Hull; also on the pales on the south west corner of the cemetery west of Hull on the Aylmer road, Que. 1891. (*Macoun.*)

(324.) **U. Barclayi,** Mitt.; Lesq. & James, Mosses of N. America, 164; Mitt. Journ. Linn. Soc. VIII., 26.

Sitka. (*Barclay.*)

(325.) **U. connectens,** Kindb. (n. sp.); Canadian Musci, No. 557.

Orthotrichum connectens, Kindb. Ott. Nat. IV, 64.

Monœcious. Tufts soft, pulvinate, green above, blackish below. Stems erect. Leaves from an ovate concave base linear-lanceolate,

when dry very much crisped, when moist subarcuate, short-attenuate to the acute apex; borders revolute above the base, for the greater part, at least on one side, distinctly papillose, also at the back; cells at basal wings sub-quadrate hyaline with incrassate transverse walls, those next the costa narrower, rectangular, in straight rows, the lowest orange; costa pale, subpercurrent. Male flower at the side of the female. Inner perigonial leaves broad, short-ovate, obtusate or suddenly short-acuminate; cells round only in the acumen, the others narrow, the lower basal wider and yellow; antheridia about 9, with several paraphyses. Perichetial leaves with sublinear basal cells. Capsule dark-brown, short subovoid, not contracted on the mouth, costate; pedicel short, scarcely emergent. Calyptra densely hairy.

This species is a true *Ulota*, although the revolute leaf-borders, the distinctly papillose cells and the short pedicellate capsule are more like to an *Orthotrichum*.

On cedar trees in Dow's Swamp near Ottawa; on trees at Owen Sound, Ont., Sept. 17th, 1890. (*Macoun.*)

55. ORTHOTRICHUM, Hedw.

(326.) **O. anomalum,** Hedw.; Lesq. & James, Mosses of N. America, 164; Canadian Musci No. 118, in part; Mitt. Journ. Linn. Soc. VIII, 24.

On rocks at Fredericton, N.B. (*Fowler's Cat.*) On rocks, McKay's Woods, Ottawa; on rocks, Gibson's Mountain, Prince Edward Co., Ont.; on rocks at Belleville and Shannonville, Hastings Co., Sudbury Junction and Lake Nepigon, Ont.; at Kananaskis River crossing of C. P. Ry., Rocky Mountains. (*Macoun.*) On rocks, Buffalo Lake and Clearwater River, lat. 56° N.W.T. (*J. M. Macoun.*) Saskatchewan, (*Bourgeau.*) Abundant on rocks at Kingston and Wolfe Island, Ont. (*Fowler.*) Greenland. (*Fl. Gr.*)

Var. **Americanum,** Vent. (n. var.)

O. anomalum, Drumm. Musc. Bor.-Am., No. 148; Canadian Musci, No. 118, in part.

This is a form that has a yellow capsule and differs considerably from the normal form, in the well-evolute cilia.

Upon rocks; common. (*Drummond.*) On rocks along the shore of Lake Winnipegoosis, Man.; on boulders and sandstone rocks, Hand Hills, Alberta. (*Macoun.*)

—— Var.

O. Venturi, Canadian Musci, No. 455.

On cedar (*Thuya occidentalis*) rails, Simon Terrill's farm, Brighton, Northumberland Co., Ont., October 4th, 1888. (*Macoun.*)

(327.) **O. Blyttii,** Schimp.; Greenland Flora, 351.

Greenland. (*Fl. Gr.*)

(328.) **O. nudum,** Dicks. var. **Rudolphianum,** Schimp.

O. cupulatum, Drumm. Musc. Bor.-Am., No. 152.

Rocks near the Whirlpool, below Niagara Falls. (*Drummond.*) On rocks, Deer Park, Lower Arrow Lake, Columbia River; also along Kootanie Lake, B.C. (*Macoun.*)

(329.) **O. lævigatum,** Zett.; Lesq. & James, Mosses of N. America, 165; Canadian Musci, No. 454.

On rocks at Kicking Horse Lake, and on great boulders, three miles below, Rocky Mountains; common in tufts on boulders at Lytton, B. C.; also on rocks at Revelstoke, B. C.; Deer Park, Lower Arrow Lake, B. C. (*Macoun.*)

(330.) **O. cupulatum,** Hoffm.; Lesq. & James, Mosses of N. America, 165; Canadian Musci, No. 583.

On rocks, Mount Erskine, Vesuvius Bay, Salt Spring Island, Gulf of Georgia, B. C.; on rocks on mountain slopes at Spence's Bridge, B. C. (*Macoun.*) Baffin's Bay. (*Ross, Voy.*)

Var. **minus,** Sulliv.; Lesq. & James, Mosses of N. America, 165.

On trees, near the water, Presqu'ile Point, Lake Ontario, Aug. 16th, 1868. (*Macoun*)

(331.) **O. Sturmii,** Hoppe & Hornsch.; Lesq. & James, Mosses of N. America, 166.

On rocks at Hector, Rocky Mountains; on rocks at Deer Park, Lower Arrow Lake, Columbia River, B.C. (*Macoun.*)

(332.) **O. Texanum,** Sulliv.; Lesq. & James, Mosses of N. America, 166; Canadian Musci, No. 119.

The stomata are superficial; the lower leaf-cells dark orange.
On rocks in the Coast Range a few miles above Yale; on rocks,

Lake Mara, Sicamous, B.C.; and on rocks near Victoria, Vancouver Island. (*Macoun.*)

Var. **globosum,** Lesq.; Lesq. & James, Mosses of N. America, 166.

O. Texanum, Canadian Musci, No. 119, in part.

On rocks at Agassiz and Yale, B.C. (*Macoun.*)

(333.) **O. Grœnlandicum,** Berggr.; Greenland Flora, 351.

Holstensborg, Greenland. (*Fl. Gr.*)

(334.) **O. Breutelii,** Hampe; Greenland Flora, 350.

Apparently common in Greenland. (*Fl. Gr.*) Fredericksbaab. (*Rosenvinge.*)

(335.) **O. Barthii,** Sendtn.; Greenland Flora, 351.

Island of Amitsuavsuk, Greenland. (*Fl. Gr.*)

(336.) **O. rupestre,** Schleich.; Lesq. & James, Mosses of N. America, 167.

O. rupincola, Drumm. Musc. Bor.-Am., No. 156.
O. Watsoni, Canadian Musci, No. 121.

On very large boulders about three miles below Hector and at Banff in the Rocky Mountains; on rocks at Sicamous, Revelstoke and Yale, B.C. (*Macoun.*) Upon rocks amongst the Rocky Mountains. (*Drummond.*)

(337.) **O. affine,** Schrad.; Lesq. & James, Mosses of N. America, 168; Drumm. Musc. Bor.-Am., Nos. 150 and 151.

On trees, Cove Head, Prince Edward Island, July 5th, 1888. (*Macoun.*) Upper Canada (Ontario), and about Lake Superior, on trees. (*Drummond.*) Trunks of trees, Lake Superior. (*Agassiz.*) Smith's Sound, between Lat. 78°–82°. (*Dr. Hayes.*)

(338.) **O. alpestre,** Hornsch.; Lesq. & James, Mosses of N. America, 168.

O. affine, Drumm. Musc. Bor.-Am., No. 149.

Upon trees; from Upper Canada (Ontario) to the Rocky Mountains. (*Drummond.*)

(339.) **O. speciosum,** Nees; Lesq. & James, Mosses of N. America, 169; Canadian Musci, No. 120; Drumm. Musc., Bor.-Am., Nos. 158 and 155.

O. elegans, Schw.; Mitt., Journ. Linn. Soc., VIII., 24; Drumm. Musc. Bor.-Am., No. 155.

O. leiocarpum, Canadian Musci, No. 126, in part.

Upon trees, Upper Canada (Ontario). (*Drummond.*) On trees, Bass River and at Fredericton, N.B. (*Fowler's Cat.*) On trees, Dalhousie and Pictou, N.S. (*McKay.*) Tadousac, Que. (*St. Cyr.*) On logs and trees, Gaspé Co., Que.; on trees at Ottawa and Owen Sound, Ont.; on trees, Lake Winnipegoosis, Man.; on trees at Comox and Victoria, Vancouver Island; also at Sicamous, B.C. (*Macoun.*) On trees, Canaan Forks, Queen's Co., N.B.; on trees, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On trees at Bass River and Fredericton, N.B. (*Fowler's Cat.*) Abundant on trees in various parts of Prince Edward Island; on trees, coast of Gaspé Co., Que.; Belleville and Owen Sound, Ont.; on trees near Green Lake, Saskatchewan; at Morley near the Rocky Mountains; at Lesser Slave Lake, N.W.T. (*Macoun.*)

(340.) **O. Braunii,** Bruch & Schimp.; Bryol. Europ.

On trees, near Brackley Point, Prince Edward Island, August 2nd, 1888. (*Macoun.*)

(341.) **O. Killiasii,** C. Muell.; Greenland Flora, 350.

Disco Island. Greenland. (*Fl. Gr.*)

(342.) **O. sordidum,** Sulliv. & Lesq.; Lesq. & James, Mosses of N. America, 170; Canadian Musci, No. 122. (?)

On trees, Bass River, Kent Co., N.B. (*Fowler's Cat.*) On trees at Campbellton, N.B.; common at Ottawa and Sudbury Junction, Ont.; quite common on maple trees at Goulais Bay, Lake Superior. (*Macoun.*) On trees at Tay Forks, York Co., and Canaan Forks, Queen's Co., N.B. (*J. Moser.*) All these references are doubtful, as the specimens remain undecided.

(343.) **O. Ohioense,** Sulliv. & Lesq.; Lesq. & James, Mosses of N. America, 170.

O. psilocarpum, Canadian Musci., No. 123, in part.

On trees at Bass River, Kent Co., N.B. (*Fowler's Cat.*) On trees, Cove Head, Prince Edward Island; on trunks at Ottawa, Belleville and Owen Sound, Ont. (*Macoun.*) On trees, Canaan Forks, Queen's Co., N.B. (*J. Moser.*)

(344.) **O. Schimperi,** Hamm.

O. fallax, Schimp.; Lesq. & James, Mosses of N. America, 171.

Not uncommon on trees at Ottawa; on fence rails at Carleton Place and on trees on Massassagua Point, Bay of Quinte, Ont. (*Macoun.*)

(345.) **O. brachytrichum,** Schimp.; Lesq. & James, Mosses of N. America, 172.

O. obtusifolium, Drumm. Musc. Bor.-Am., No. 157.

Upon trees in the country extending from Upper Canada (Ontario), to the Rocky Mountains. (*Drummond.*)

I believe Drummond's specimen to be really *O. obtusifolium.*

(346.) **O. strangulatum,** Beauv.; Lesq. & James, Mosses of N. America, 172; Canadian Musci, No. 124.

On trees at Bass River and Fredericton, N.B. (*Fowler's Cat.*) On trees at Cove Head, P.E.I.; also at Pictou, N.S.; on trees in woods around Ottawa; at Belleville and Owen Sound, and also at Lake Nepigon, Ont. (*Macoun.*) On poplar trees at Pictou, N.S. (*McKay.*)

(347.) **O. tenellum,** Bruch; Lesq. & James, Mosses of N. America, 172.

On trees at London, Ont., 1889. (*J. Dearness.*)

(348.) **O. consimile,** Mitt.; Lesq. & James, Mosses of N. America, 173.

On trees, Vancouver Island. (*Lyall.*) We are not acquainted with this species.

(349.) **O. lonchothecium,** C. M. & Kindb. (n. sp.)

Differs from *Orthotrichum speciosum* in the capsule being shorter than the pedicel, when moist, and the calyptra narrower; the peristome erect when dry, the cilia of one row of cells.

On trees at the mouth of Kraо Creek, Kootanie Lake, B.C., July 13th, 1890; also on trees at Banff, Rocky Mountains, 1891. (*Macoun.*)

(350.) **O. Rœllii,** Vent. Bot. Can., 51 (1890), 6. (n. sp.)

O. lonchothecium, Canadian Musci, No. 497.

On rocks, Fort Chipweyan, Lake Athabasca, N.W.T.; on rocks at Yale, B.C., May 17th, 1875; also on rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C. (*Macoun.*)

(351.) **O. psilothecium,** C. M. & Kindb. (n. sp.)

Plants small, 1 cm. long or less, green. Leaves short oblong-lanceolate, obtusate or short-acuminate, sub-obtuse, revolute at the borders to the greater part, faintly papillose; costa percurrent. Capsule small, immersed, oblong not striate before sporosis, very short-necked; vaginula naked; calyptra slightly hairy at the blackish apex, finally glabrous and light-brown, narrow, covering the whole capsule; lid rostellate. Male flowers on distinct branches.

This species has the habit of *Orthotrichum fallax*, Schimp. (*O. Schimperi*, Hamm.) We have not been able to examine the peristome and the stomata of the capsule, because only one capsule (in our specimens) is nearly ripe, the others are quite unripe.

On old fences along the Richmond Road, and near Rockcliffe, Ottawa; also on old fences at Carleton Place, August 26th, 1889. (*Macoun.*)

(352.) **O. cylindrocarpum,** Lesq.; Lesq. & James, Mosses of N. America, 173.

On rocks at the "Gap," Bow River Pass, Rocky Mountains. (*Macoun.*)

(353.) **O. psilocarpum,** James; Lesq. & James, Mosses of N. America, 173.

On trunks of trees on Pelee Point and Pelee Island, Lake Erie. (*Macoun.*)

(354.) **O. leiocarpum,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 174.

O. striatum, Drumm. Musc. Bor.-Am., No. 154.

Upon trees in Upper Canada (Ontario), and about Lake Superior. (*Drummond.*) Lake Superior. (*Agassiz.*)

(355.) **O. pallens,** Bruch; Lesq. & James, Mosses of N. America, 175.

Pack River, British Columbia. (*Lyall.*)

(356.) **O. pulchellum,** Brunton Lesq. & James, Mosses of N. America, 175; Canadian Musci, No. 127.

O. consimile, Canadian Musci, No. 125.
O. Columbicum, Mitt. Journ. Linn. Soc., VIII., 24.

On trees, Vancouver Island. (*Lyall.*) On trees, quite common at Victoria, Nanaimo and Comox, Vancouver Island; also on trees both

sides of Burrard Inlet, B.C. (*Macoun.*) Coal Harbor, Alaska. (*Harrington.*)

(357.) **O. canum,** Mitt.; Lesq. & James, Mosses of N. America, 176; Mitt. Journ. Linn. Soc., VIII., 26.

British North America. (*Drummond.*)

(358.) **O. obtusifolium,** Schrad.; Lesq. & James, Mosses of N. America, 177; Canadian Musci, No. 128.

British America. (*Drummond.*) On trees at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On poplar trees, Bass River and Fredericton, N.B. (*Fowler's Cat.*) On poplar trees at Kingston, N.S.; on same species of trees, Cove Head, P.E.I.; also at the mouth of Madeline River, Gaspé Co., Que.; on old rails and poplar trees at Ottawa, Belleville, Owen Sound, Lake Nipissing, and at Lake Nepigon, Ont.; on poplar trees, Kananaskis River, Rocky Mountains; also along Eagle River at Sicamous, B.C.; on trees at McLeod's Lake and along Peace River, Lat. 56°, B.C. (*Macoun.*) On trunks at London, Ont. (*J. Dearness.*)

(359.) **O. Jamesianum,** Sulliv.; Lesq. & James, Mosses of N. America, 177.

On rocks at Fort St. James, Northern British Columbia, and on rocks at Yale, and Spence's Bridge, B.C. (*Macoun.*) Doubtful specimens from Bow River Pass, Rocky Mountains.

(360.) **O. Lyellii,** Hook. & Tayl.; Lesq. & James, Mosses of N. America, 177; Canadian Musci, No. 130.

Very common on trees in many parts of Vancouver Island, especially on oak trees; on trees at Hastings, Burrard Inlet, B.C., 1889. (*Macoun.*)

Var. **papillosum,** Lesq. & James, Mosses of N. America, 178; Canadian Musci, No. 464.

Quite common on trees in the vicinity of Victoria, Vancouver Island, 1887. (*Macoun.*)

Var. **Pringlei,** C. Muell.

On rocks at Lytton, B.C., April 17th, 1889. (*Macoun.*)

(361.) **O. Canadense,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 171.

Drummond's Rocky Mountain Collection, Nos. 149 and 151.

56. ENCALYPTA, Schreb.

(362.) **E. commutata,** Nees & Hornsch.; Lesq. & James, Mosses of N. America, 180.

E. affinis, Drumm. Musc. Bor.-Am., No. 49.

Rocks and banks amongst the Rocky Mountains. (*Drummond.*)

(363.) **E. vulgaris,** Hedw.; Lesq. & James, Mosses of N. America, 181.

Alaska. (*Lesq. & James.*) Under ledges of limestone rocks at the Ferry Crossing opposite Belleville, Ont.; and on limestone rocks at Leamy's Lake, near Ottawa. (*Macoun.*)

(364.) **E. rhabdocarpa,** Schwaegr; Lesq. & James, Mosses of N. America, 181; Canadian Musci, No. 131; Drumm. Musc. Bor.-Am. 51.

Rocks and banks amongst mountains. (*Drummond.*) On rocks, Falls of Ste. Anne des Monts River, Gaspé Co., Que.; on stones along Peace River below the mouth of Smoky River; on loose stones and gravel, Cypress Hills, Alberta; crevices of rocks "Dry Cañon," discharge of Devil's Lake, at Banff, Silver City, and Hector, Rocky Mountains, also in the foothills at Morley; along the Telegraph Trail near Quesnel, B.C.; on earth, rocky slopes near Kamloops, B.C. (*Macoun.*) Nulato. (*Roth. Alask.*) Clavering Island, Greenland. (*Fl. Gr.*)

(365.) **E. subspathulata,** C. M. & Kindb. (n. sp.)

E. spathulata, Canadian Musci, No. 421.

Monœcious. Stem very short, about 0.5 cm. high. Leaves bright green, spathulate or lingulate, twisting when dry, the upper spreading when moist; inner basal cells short-rectangular, smooth and hyaline, finally red-brown, the outer ones very much longer, narrower and yellowish; costa faintly reddish below, yellow above, long-excurrent. Capsule cylindrical, short-necked, smooth or finally furrowed when dry; peristome pale, partly incomplete and membranose, but distinct and high; calyptra small, papillose in the narrower part, yellowish-green, not covering the whole capsule, not fringed; pedicel red.

Nearly allied to *E. vulgaris* but *it* has the peristome merely present. the calyptra longer, and the upper leaves not spreading. The true *E, spathulata,* C. Muell., has a shorter capsule without a peristome.

Quite common on boulders on the sides of ravines near the Fraser River, below Lytton, B.C., April 17th, 1889; on earth near McLeod's Lake, B.C. Lat. 55°. June 25th, 1875. (*Macoun.*)

(366.) **E. leiomitra,** Kindb. (n. sp.)

E. rhabdocarpa, Schw. var. *leiomitra,* Kindb. Ott. Nat. Vol. IV. 61.

Nearly allied to *E. rhabdocarpa* but differing in the leaves being shorter, often subspathulate, with the costa vanishing at the apex, peristomial teeth nearly blunt, calyptra not papillose, the spores larger.

On rocks along the Clearwater River, Athabasca. Lat. 57°. July 11th, 1888. (*J. M. Macoun.*)

(367.) **E. Macounii,** Aust.; Lesq. & James, Mosses of N. America, 182; Canadian Musci, No. 133.

E. ciliata, Drumm. Musc. Bor.-Am., No. 50.

On rocks, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Crevices of rocks, Tobique River, N.B. (*Hay.*) On rocks along the Gaspé coast, Que.; quite common on rocks at Shannonville, and at Leamy's Lake and Rockcliffe, Ottawa; on earth at Pelee Point, Lake Erie; and in crevices of rocks, Lake Nepigon; also abundant on rocks at Fort Chipwcyan, Lake Athabasca; also on rocks at Hector, Rocky Mountains; on rocks, Deer Park, Lower Arrow Lake; on rocks at Stewart's Lake Mountain, B.C.; quite common on damp rocks at Agassiz, Câche Creek and Sicamous, B.C.; very abundant on rocks at Departure Bay and Victoria, Vancouver Island. (*Macoun.*) Rocks and banks amongst the Rocky Mountains. (*Drummond.*) Ounalaska and Kadiak Islands, Behring Sea, 1891. (*J. M. Macoun.*) Rocky ledges, Mount McKay, near Fort William and Kakabeka Falls, Lake Superior. (*Mrs. G. E. Britton.*) Greenland. (*Fl. Gr.*)

(368.) **E. ciliata,** Hedw.; Lesq. & James, Mosses of N. America, 182 Canadian Musci, No. 132.

Encalypta ciliata, Hedw., and *E. Macounii,* Aust., are very difficult to distinguish apart. The descriptions of the best authors are also not consistent. *Schimper* in synops. muscor. Europ. p. 343, says: "Peristomium siccitate capsulam horizontaliter claudens, humiditate patens;" *Braithwaite,* Brit. Moss-flora, p. 283, "peristome when dry horizontally closing the capsule, patent when moist;" Lesq, & James, Mosses of N. America, p. 182, "peristome spreading when dry;" Boulay, Muscinées de la France, p. 314, "dents du peristome dressées à l'état sec, inflechies en voûte surbaissée à l'état humide." It is probable that the authors are confounding both species, also occurring in Europe. *E. ciliata* is principally found growing in the lower mountain districts. *E. Macounii* seems to be an alpine species also collected by Kindberg in the Norwegian Alps and considered as a new species, *E. borealis,* Kindb.

Laubm. Schwed. & Norweg., but exactly agreeing with the original specimens of *E. Macounii* sent by Prof. Macoun. The description, made by Austin, cited by Lesq. & James, is, however, not completely exact: "calyptra densely papillose, pedicel reddish, papillose, the leaves muticous;" such characters are not to be found, the calyptra and the yellow pedicel are nearly smooth as in the true *E. ciliata*, to which the descriptions of the peristome by Schimper and Braithwaite probably belong. The descriptions by Lesq. & James and Boulay could partly be referred to *E. Macounii*, although all authors agree in the description of the capsule of *E. ciliata*, "without a distinct collum"; *E. Macounii* has a distinct collum and the margin of the leaves distinctly reflexed. I possess no specimens of the true *E. ciliata* from North America. It may not occur there.

(369.) **E. leiocarpa,** Kindb. Bull. Torr. Bot. Club. XVII. 273.

Monœcious. Stem 3-4 cm. high, dichotomously branched, radiculose. Leaves erect-patent, lingulate, faintly revolute nearly all around, without a hair-point; the lower decolorate brown, subacute, incurved; the comal larger, green, obtuse, slightly twisted; basal cells hyaline, the marginal very papillose; costa faintly papillose, not excurrent, in the lower leaves brown, in the comal green or reddish at the base. Perigonial leaves with a short thick tip. Capsule straight, smooth, cylindric with a short apophysis; peristome simple, orange; pedicel red; calyptra papillose all around, not fringed.

This species, in habit, resembles *E. streptocarpa*, but the capsule and the peristome are very different, nearly as in the true *E. longipes*, Mitt., by Lesq. & James considered as *E. procera*, distinguished by the twisted capsule and the double peristome.

Crevices of rocks summit of Mount Queest, Gold Range, B.C. Alt. 6,500 feet. (*J. M. Macoun.*)

(370.) **E. longipes,** Mitt. Journ. Linn. Soc. VIII. 29; Canadian Musci, No. 474.

Stem about 2 cm. high or lower, branched and radiculose. Leaves erect-patent, narrow, sublingulate, revolute all around, short-acuminate, obtusate or sub-acute, without a hairpoint; the lower decolorate brown, incurved, the upper green, irregularly crisped; lower basal cells hyaline.

Differs from *Encalyptra leiocarpa* principally in the stem being shorter, the leaves short-acuminate or subacute, costa very rough, narrowed from the base, the calyptra regularly laciniate, very rough and subspinulose above, blackish to a third of the apex, the capsule

included. The authentic specimens of Drummond were consulted in the collections of Dr. C. Mueller.

Quite common along the edge of the torrent at Hector, and on rocks in the "Dry Cañon," discharge of Devil's Lake, Rocky Mountains. (*Macoun.*)

(371.) **E. procera,** Bruch ; Lesq. & James, Mosses of N. America, 182 ; Canadian Musci, No. 565.

E. streptocarpa, Drumm. Musc. Bor.-Am., No. 48.

Rocks and banks amongst the Rocky Mountains. (*Drummond.*) Crevices of rocks, Lake Nepigon, Ont. ; on wet rocks near Hector and at the "Gap," Rocky Mountains ; also on the bank of the Columbia River at Revelstoke, B.C. 1890. (*Macoun.*) Clavering Island, Greenland. (*Fl. Gr.*)

(372.) **E. Selwyni,** Aust. ; Lesq. & James, Mosses of N. America, 183 ; Canadian Musci, No. 134.

On rocks at Hector, Rocky Mountains ; on earth at Câche Creek and Quesnel, B.C., and at Lesser Slave Lake, N.W.T. ; also on rocks in the vicinity of Victoria, Vancouver Island. (*Macoun.*)

(373.) **E. streptocarpa,** Hedw. ; Lesq. & James, Mosses of N. America, 183 ; Canadian Musci, No. 135.

On rocks at Leamy's Lake near Ottawa ; abundant on limestone rocks at Owen Sound and at the Fishing Islands, Lake Huron ; on rocks, Kananaskis, Rocky Mountains. (*Macoun.*)

(374.) **E. cucullata,** C. M. & Kindb. (n. sp.) ; Canadian Musci, No. 491.

Monœcious. Leaves cucullate, the perichetial ones long-acuminate acute with a long hair-point ; costa percurrent, red only at the base ; calyptra papillose all around.

This species is nearly allied to *E. procera* which has the upper leaves, also the perichetial, obtuse or subacute, the costa in most leaves red for the whole length.

On earth along the west bank of the Columbia River, at Revelstoke, B.C., May 9th, 1890. (*Macoun.*)

57. MERCEYA, Schimp.

(375.) **M. (Scopelophila) latifolia,** Kindb., Bull. Torr. Bot. Club, XVI., 94 ; Canadian Musci, No. 459.

Densely cæspitose. Plants 1-2 cm. high, brown-ferruginous below, green at the tips, divided, at the base radiculose. Leaves quite smooth, spathulate-lingulate, obtusate or sub-acute, entire, slightly reflexed at base, plane above, broad-bordered with greater, orange-colored cells ; basal cells narrow, upper small and round ; costa percurrent or scarcely excurrent. Habit of *Barbula ruralis.*

On the upper slopes of Mount Finlayson near Goldstream, Vancouver Island, May 18th, 1887. (*Macoun.*) This fine species was found in California (Herb. *C. Mueller*) but not described. (*Kindberg.*)

X. TETRAPHIDEÆ.

58. TETRAPHIS, Hedw.

(376.) **T. pellucida,** Hedw. ; Lesq. & James, Mosses of N. America, 186 ; Canadian Musci, No. 136 ; Drumm. Musc. Bor.-Am., No. 31.

About the roots of trees in the country extending from the Atlantic to the Rocky Mountains. (*Drummond.*) Chicken Bay, Trinity Bay and Green Harbor, Newfoundland. (*Rev. A. Waghorne.*) Miquelon Island. (*Delàmare.*) Pictou Co., N.S. (*McKay.*) On rotten wood, common, N.B. (*Fowler's Cat.*) On decaying stumps, Tobique River, N.B. (*Hay.*) Common on old stumps at Canaan Forks, N.B. (*J. Moser.*) On the bases of rotten stumps in swamps across the continent. Ste. Anne des Monts River, Gaspé Co., Que. ; quite common on Prince Edward Island ; abundant at Ottawa, Belleville, Carleton Place, Lake Nipissing, Owen Sound, Wooler, Port Dover, Leamington and Lake Nepigon, Ont. ; woods, shore of Lake Winnipegoosis, Man. ; Columbia River at Donald and Revelstoke, also at Quesnel and Sicamous, B.C. ; at Comox, Vancouver Island. (*Macoun.*) Saskatchewan. (*Bourgeau.*) Athabasca River, N.W.T. (*J. M. Macoun.*) Very common on stumps in swamps at London, Ont. (*J. Dearness.*) Sitka. (*Roth. Alask.*) Mountains of British Columbia. (*Lyall.*)

(377.) **T. geniculata,** Girgens. ; Lesq. & James, Mosses of N. America, 187 ; Canadian Musci, No. 422.

Moose River. (*Lyall.*) Sitka. (*Rothrock.*) On old logs in a swamp at Revelstoke, Columbia River ; also in a swamp at Craig-

allachie, Eagle Pass, and at Hastings on Burrard Inlet, B.C. (*Macoun.*) Sitka and Prince of Wales Island. 1891. (*J. M. Macoun.*) Appears to be common at Trinity Bay, Newfoundland. (*Rev. A. Waghorne.*)

XI. SCHISTOSTEGEÆ.

59. SCHISTOSTEGA, Mohr.

(378.) **S. osmundacea,** Web. & Mohr; Lesq. & James, Mosses of N. America, 188; Canadian Musci, No. 137.

On the earth among the roots of turned-up stumps at Sudbury Junction, Ont.; at Castle Mountain, Rocky Mountains; Six-Mile and Beaver creeks and Roger's Pass, Selkirk Mountains; Revelstoke, and at Hastings, Burrard Inlet; McLeod's Lake, Northern British Columbia. (*Macoun.*)

XII. SPLACHNEÆ.

60. DISSODON, Grev. & Arn.

(379.) **D. Frœlichianus,** Grev. & Arn.; Lesq. & James, Mosses of N. America, 190; Canadian Musci, No. 138.

Splachnum Frœlichianum, Drumm. Musc. Bor.-Am., No. 44.
" " var. *elongata,* No. 45.

Summits of the Rocky Mountains; not rare upon the turfy soil (44); alpine marsh in the Rocky Mountains. (45) (*Drummond.*) Wet slopes at the summit of Copper Mountain, Bow River Pass, and at Lake Agnes near Laggan, Rocky Mountains. (*Macoun.*) Greenland. (*Fl. Gr.*)

(380.) **D. Hornschuchii,** Grev. & Arn.; Lesq. & James, Mosses of N. America, 189.

Systylium splachnoides, Drumm. Musc. Bor.-Am., No. 46.

Summit of the (Rocky) mountains, in turfy soil, along with No. 44. (*Drummond.*)

(381.) **D. splachnoides,** Grev. & Arn.; Lesq. & James, Mosses of N. America, 190; Canadian Musci, No. 139.

Weisia turbinata, Drumm. Musc. Bor.-Am., No. 64.

Marshy spots near York Factory, Hudson Bay. (*Drummond.*) Boggy soil, summit of Mount Albert, Gaspé Co., Que., alt. 4,000 feet;

mountain bogs at Hector, Rocky Mountains ; and on Avalanche Mountain in Roger's Pass in the Selkirks ; also in the Gold Range north of Griffin Lake, B.C. ; alt. 7,000 feet. (*Macoun.*) Godhavn, Greenland. (*Fl. Gr.*)

61. TAYLORIA, Hook.

(382.) **T. serrata,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 191 ; Canadian Musci, No. 140.

Centre Hill, New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Alaska. (*Kellogg.*) At Goldstream, near Victoria, Vancouver Island, and along a roadside near Vesuvius Bay, Salt Spring Island, Gulf of Georgia, B.C. (*Macoun.*) Prince of Wales Island, 1891. (*J. M. Macoun.*)

(383.) **T. tenuis,** Schimp. ; Lesq. & James, Mosses of N. America, 191 ; Canadian Musci, No. 141.

Abundant in woods, Little Fox River, Gaspé Co., Que., July 28th, 1882 ; on earth in woods at Pirate's Cove, Straits of Canso, N.S. (*Macoun.*) Barrens near Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Greenland. (*Fl. Gr.*)

(384.) **T. splachnoides,** Hook. ; Lesq. & James, Mosses of N. America, 191 ; Drumm. Musc. Bor.-Am., No. 47.

About the root of a decayed tree, among the Rocky Mountains ; found in one spot only, and there sparingly. (*Drummond.*) On rather dry rock covered with mosses, side of a ravine on Mount Albert, Gaspé Co., Que. (*J. A. Allen.*)

(385.) **T. acuminata,** (Schleich.) Hornsch.

On damp rocks in the " Dry Cañon " near the discharge of Devil's Lake, Rocky Mountains, Aug. 10th, 1891. (*Macoun.*)

62. TETRAPLODON, Bruch & Schimp.

(386.) **T. angustatus,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 192 ; Canadian Musci, No. 142.

Splachnum augustatum, Drumm. Musc. Bor.-Am., No. 42.

Mountain woods ; extremely common on the droppings of the fox and wolf. (*Drummond.*) At Madawaska, N.B. (*Brittain.*) On animal droppings, in pine woods chiefly, Rideau River, Lake Superior ;

Lake Nepigon, Ont., and Lake Winnipegoosis, Man.; very common in the woods between Edmonton and Lesser Slave Lake; also at Canmore, Banff and Hector in the Rocky Mountains; at McLeod's Lake, lat. 55°, B.C. (*Macoun.*) Near Lily Lake, St. John, N.B. (*Hay.*) In woods, at Placentia Bay and New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

(387.) **T. mnioides,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 192; Canadian Musci, No. 143.

Splachnum mnioides, Drumm. Musc. Bor.-Am., Nos. 40 and 41.

Common on animal droppings in the country extending from York Factory to the Rocky Mountains (Nos. 40 and 41). (*Drummond.*) Miquelon Island. (*Delàmare.*) Highland Park, St. John, and Tobique River, N.B. (*Hay.*) Paroquet Island, Labrador, and Table Top Mountain, Gaspé Co., Que. (*J. A. Allen.*) On animal droppings from Lake Superior and Lake Nepigon, westward in the wooded country to Lesser Slave Lake; Bow River Pass, Castle Mountain, Devil's Lake and Banff, Rocky Mountains. (*Macoun.*) New Harbor, and Centre Hill, Newfoundland. (*Rev. A. Waghorne.*) Sitka and Kotzebue Sound. (*Roth. Alask.*) St. Paul Island and Attu Island, Behring Sea. 1891. (*J. M. Macoun.*) Smith's Sound. (*Dr. Kane.*) Greenland. (*Fl. Gr.*)

(388.) **T. australis,** Sulliv. & Lesq.; Lesq. & James, Mosses of N. America, 192.

On Isle Madame, Cape Breton, N.S. (*J. A. Allen* fide *Lesq. & James.*)

(389.) **T. urceolatus,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 193.

Splachnum urceolatum, Drumm. Musc. Bor.-Am., No. 38.

Summits of the (Rocky) Mountains; (rare ?) (*Drummond.*) Kotzebue Sound. (*Roth. Alask.*) St. Matthew Island, Behring Sea. 1891. (*J. M. Macoun.*)

63. SPLACHNUM, Linn.

(390.) **S. Wormskioldii,** Hornem.; Lesq. & James, Mosses of N. America, 194.

Peat bogs of Arctic America. (*Lesq. & James.*) Smith's Sound, between lat. 78°—82°. (*Dr. Kane.*) Jakobshavn, Greenland. (*R. Brown.*)

(391.) **S. sphæricum,** Linn.; Lesq. & James, Mosses of N. America, 194; Canadian Musci, No. 144; Drumm. Musc. Bor.-Am., No. 35; var. elongatum, No. 36.

S. intermedium, Drumm. Musc. Bor.-Am., No. 39.

Mountain woods, common; on the droppings of buffalo (Nos. 35 and 36); York Factory on the dung of animals (No. 39). (*Drummond.*) On animal droppings at Swan Lake House, Man.; in woods at McLeod's Lake, lat. 55°, B.C.; around springs at Morley (station) and Hector, Rocky Mountains. (*Macoun.*) Norton Sound. (*Roth. Alask.*)

(392.) **S. vasculosum,** Linn.; Lesq. & James, Mosses of N. America, 194; Drumm. Musc. Bor.-Am., No. 34.

S. heterophyllum, (n. sp.) Drumm. Musc. Bor.-Am., No. 37.

York Factory, Hudson Bay; near a saline spring amongst the Rocky Mountains, where no other vegetable existed; and upon the dung of some animal. (*Drummond.*) Sitka. (*Bischoff.*) Smith's Sound. (*Dr. Kane.*) Smith's Sound, between lat. 78°—82°. (*Dr. Hayes.*) Godhavn, Greenland. (*Fl. Gr.*)

(393.) **S. ampullaceum,** Linn.; Lesq. & James, Mosses of N. America, 194; Canadian Musci, No. 145.

Miquelon Island. (*Delàmare.*) On earth, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Swamps at Bocabec and St. John, N.B. (*Hay.*) On earth at Fredericton Junction, N.B. (*Fowler.*) Bogs, North Sydney, Cape Breton; Straits of Canso, N.S.; swamps along Jupiter River, Anticosti; and in swamps along Lake Nepigon, Ont. (*Macoun.*) In bogs, Portage La Loche, N.W.T. (*J. M. Macoun.*) On earth, Cooper's Pond and at New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

(394.) **S. rubrum,** Linn.; Lesq. & James, Mosses of N. America, 195; Drumm. Musc. Bor.-Am., No. 32.

Bass River, Kent Co., N.B. (*Fowler's Cat.*) Lancaster, N.B. (*Hay.*) Shady woods amongst the (Rocky) mountains; on the droppings of animals, but rare. (*Drummond.*) In bogs, Portage La Loche, N.W.T. (*J. M. Macoun.*)

(395.) **S. luteum,** Linn.; Lesq. & James. Mosses of N. America, 195; Drumm. Musc. Bor.-Am., No. 33.

Shady woods amongst the (Rocky) Mountains. (*Drummond.*) Woods along the Finlayson River, lat. 60° 30′, N.W.T. (*Dawson.*)

(396.) **S. melanocaulon,** Schw.; Mitt. Journ. Linn. Soc., VIII. 22.

This species has been several times brought from Western North America; and some specimens have been collected by Mr. Burke. (*Mitten.*)

64. ŒDIPODIUM, Schwaegr.

(397.) **Œ. Griffithianum,** (Dicks.) Schw.

Greenland. (*Fl. Gr.*)

XIII. PHYSCOMITRIEÆ.

65. PHYSCOMITRIUM, Brid.

(398.) **P. immersum,** Sulliv.; Lesq. & James, Mosses of N. America, 196.

On inundated alluvial soil (in small tufts) along the outlet of Leamy's Lake near Hull, Que., Oct. 4th, 1889. (*Macoun.*)

(399.) **P. pyriforme,** Brid.; Lesq. & James, Mosses of N. America, 197.

P. Hookeri, Canadian Musci, No. 146, in part.

On earth in the vicinity of Ottawa. (*Fletcher.*) Abundant on earth, in damp spots on the commons near the Railway Bridge in Belleville, Ont. (*Macoun.*) On earth at London, Ont. (*J. Dearness.*)

(400.) **P. megalocarpum,** Kindb., Bull. Torr. Bot. Club, XVI., 94; Canadian Musci, No. 147.

Nearly allied to *Physcomitrium pyriforme,* (*Gymnostomum pyriforme,* Lindb.); leaves longer, more or less acuminate, distinctly yellow-margined; cells smaller, the upper narrower; capsule larger, subglobose; lid conic, without distinct beak; calyptra unsymmetrical bilobed with a long acumen; pedicel long.

Collected in May, 1875, and examined by Austin, who concluded it was a large variety of *P. pyriforme.* Lesq. & James make no mention of it. Remarkably fine specimens were collected again in damp places in meadows and pastures at Cedar Hill, near Victoria, Vancouver Island, May 16th, 1887. (*Macoun.*) Also found in Oregon (*Henderson* herb. *Cardot.*)

(401.) **P. Hookeri,** Hampe ; Lesq. & James, Mosses of N. America, 198 ; Canadian Musci, 146, in part.

Gymnostomum latifolium, Drumm. Musc. Bor.-Am., No. 16.

Low points of the River Saskatchewan, near Carlton House. (*Drummond.*) On wet earth at Manitoba House, Lake Manitoba, Man. (*Macoun.*)

(402.) **P. turbinatum,** C. Muell. ; Lesq. & James, Mosses of N. America, 198.

P. strangulatum, Kindb., Ott. Nat. Vol. IV. 62.

On earth at Port Stanley, Lake Erie, June 22nd, 1882. (*Macoun.*) On earth in ditches at Port Dover and London, Ont. (*J. Dearness.*)

66. FUNARIA, Schreb.

(403.) **F. calcarea,** Wahl. ; Lesq. & James, Mosses of N. America, 201.

F. Muhlenbergii, Drumm. Musc. Bor.-Am., No. 236.

Banks amongst the Rocky Mountains ; but rare. (*Drummond.*)

(404.) **F. hygrometrica,** Sibth. ; Lesq. & James, Mosses of N. America, 202 ; Canadian Musci, No. 148 ; Drumm. Musc. Bor.-Am., No. 235.

In woods where trees have been burnt ; very abundant. (*Drummond.*) Pictou Co., N.S. (*McKay.*) On recently burnt ground, Bass River, N.B. (*Fowler's Cat.*) Very common at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Common on burnt earth in Quebec. (*St. Cyr.*) Miquelon Island. (*Delàmare.*) On earth in damp, or wet, burnt woods, Salt Lake, Anticosti ; Cove Head, Prince Edward Island ; Fox River, Gaspé Co., Que. ; at Ottawa, Carleton Place, Belleville, Bismark, Owen Sound and Lake Nepigon, Ont. ; Manitoba House, Lake Manitoba, Man. ; at Morley, Banff and Hector, Rocky Mountains ; Roger's Pass, Selkirk Mountains ; at Revelstoke and Hastings, B.C. ; abundant on Vancouver Island at Victoria, Nanaimo and Comox. (*Macoun.*) Moist ground, River Rouge, Argenteuil Co., Que. (*D'Urban.*) Buffalo Lake, N.W.T. (*J. M. Macoun.*) On earth near London, Ont. (*J. Dearness.*) Neighbourhood of Kingston, Ont. (*Prof. Fowler.*) Texada Island, Gulf of Georgia, B.C. (*Dawson.*) Iktigalik. (*Roth. Alask.*) Greenland. (*Fl. Gr.*)

Var. **calvescens,** Bruch & Schimp.

On recently burnt ground at Bass River, N.B. (*Fowler's Cat.*) Lac Bean, St. Francis, N.B. (*Hay.*)

XIV. BARTRAMIEÆ.

67. BARTRAMIA, Hedw.

(405.) **B. Menziesii,** Turn.; Lesq. & James, Mosses of N. America, 204.

Philonotis leiophylla, Kindb. MS.; Canadian Musci, No. 151.

On rocks at Agassiz, B.C.; very abundant on rocks in the oak woods, around Victoria, Vancouver Island. (*Macoun.*) Vancouver Island. (*Lyall.*) Western Russian America. (*Roth. Alask.*)

(406.) **B. subulata,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 204.

Sitka. (*Rothrock.*) Flower Bay, Alaska. (*Dall.*)

(407.) **B. ithyphylla,** Brid.; Lesq. & James, Mosses of N. America, 205; Drumm. Musc. Bor.-Am., No. 238.

Rocky Mountains; rare. (*Drummond.*) On the margin of the Asulcan Glacier, and near the glaciers of Mount Cheops, Selkirk Mountains; also on the Gold Range, north of Griffin Lake, B.C.; alt. 7,000 feet. (*Macoun.*) Summit of Mount Queest, Gold Range; alt. 6,000 feet, B.C.; Ounalaska, Behring Sea. 1891, (*J. M. Macoun.*) Cascade and Rocky Mountains. (*Lyall.*) Greenland. (*Fl. Gr.*)

(408.) **B. Œderiana,** Swartz.; Lesq. & James, Mosses of N. America, 205; Canadian Musci, No. 149.

B. gracilis, Drumm. Musc. Bor.-Am., No. 240.

Rocks at Tattagouche Falls, Gloucester Co., N.B. (*Fowler's Cat.*) Rocks near St. John, N.B. (*Hay.*) Wet rocks, Gunn and Becscie rivers, Anticosti; Straits of Canso and at Truro, N.S.; on wet rocks, Ste. Anne des Monts River and on Mount Albert, Gaspé Co., Que.; on rocks, McKay's Woods, Ottawa, and at Shannonville, Hastings Co., Ont.; north shore of Lake Superior; crevices of rocks at Hector, Rocky Mountains; at Revelstoke and Agassiz, B.C. (*Macoun.*) British Columbia, near 49th parallel. (*Lyall.*) On earth near London, and at Point Edward, Ont. (*J. Dearness.*) Moist rocks; common. (*Drummond.*)

Var. **minor,** Kindb. (n. var.)

On wet rocks near the snow on Cathedral Mountain near Hector, Rocky Mountains. (*Macoun.*) Summit of Mount Queest, Gold Range, B.C. Alt. 6,000 feet. (*J. M. Macoun.*)

(409.) **B. pomiformis,** Hedw.; Lesq. & James, Mosses of N. America, 206; Canadian Musci, No. 150; Drumm. Musc. Bor.-Am., No. 237.

Rocks and shady banks. (*Drummond.*) Pictou Co., N.S. (*McKay.*) Rocky places, Bass River, and St. John, N.B. (*Fowler's Cat.*) Crevices of rocks, Tobique River, N.B. (*Hay.*) Very common on rocks at Canaan Forks and Tay, N.B. (*J. Moser.*) Crevices of rocks, River Rouge, Argenteuil Co., Que. (*D'Urban.*) On rocks, Cap Rouge, Que. (*St. Cyr.*) On rocks at London, Ont. (*J. Dearness.*) On damp rocks, Fox River, Gaspé Co., Que.; rocky ledges near Chelsea, Que.; also along the Moira River above the Railway Bridge at Belleville, Ont.; fissures of rocks at Sudbury Junction, Ont.; at Port Dover and Leamington, Lake Erie; on damp rocks, Lake Athabasca; on rocks in the Rocky and Selkirk Mountains; at Pass Creek Falls, near Sproat and at Revelstoke, B.C.; Mount Benson, near Nanaimo, Vancouver Island. (*Macoun.*) Crevices of rocks, Texada Island and Queen Charlotte Islands, B.C. (*Dawson.*) Pend d'Oreille River and Sumas Prairie, B.C. (*Lyall.*) Little Ridge, Chappal Arm, Newfoundland. (*Rev. A. Waghorne.*) Greenland. (*Fl. Gr.*)

(410.) **B. glaucoviridis,** C. M. & Kindb. (n. sp.)

Differs from *B. pomiformis* in its glaucous-green color, the leaves sheathing, not margined, suddenly short-cuspidate, the costa often excurrent. Monœcious.

On damp rocks about a mile above Revelstoke, along the Columbia River, B.C. May 5th, 1890. (*Macoun.*)

(411.) **B. circinnulata,** C. M. & Kindb. (n. sp.)

Also allied to *B. pomiformis* but still more distinct than *B. glaucoviridis.* The leaves are green, loosely disposed, circinate, long-sheathing, very long-cuspidate; costa longer excurrent. Probably dicœcious.

On rocks by a small brook, west of Black's Hotel at Hastings on Burrard Inlet, B.C., April 6th, 1889. (*Macoun.*)

(412.) **B. Halleriana,** Hedw.; Lesq. & James, Mosses of N. America, 206; Drumm. Musc. Bor.-Am., No. 239.

Rocks about the Portage River, Rocky Mountains. (*Drummond.*)

(413.) **B. breviseta,** Lindb.

In crevices of rocks, Ounalaska, Behring Sea, August 23rd, 1891. (*J. M. Macoun.*)

68. CONOSTOMUM, Swartz.

(414.) **C. boreale,** Swartz; Lesq. & James, Mosses of N. America, 207; Drumm. Musc. Bor.-Am., No. 53; Canadian Musci, No. 205.

Near New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Summit of a mountain north of Smoking River, Rocky Mountains. (*Drummond.*) Summit of Mount Albert, Gaspé Co., Que.; crevices of rocks on the mountains north of Griffin Lake, Gold Range, B.C.; alt. 7,000 feet; on rocks, summit of Mount Arrowsmith, Vancouver Island, alt. 5,996 feet. (*Macoun.*) Alaska. (*Dall.*) Kotzebue Sound. (*Roth. Alask.*) Smith's Sound, between lat. 78°—82°. (*Dr. Hayes.*) Sabine Island, Greenland. (*Fl. Gr.*)

69. PHILONOTIS, Brid.

(415.) **P. marchica,** Brid.

P. Macounii, Lesq. & James, Mosses of N. America, 208; Canadian Musci, No. 152.

Wet springy places, Oak Hills, Hastings Co., and in a ditch at Murray Town Hall, Northumberland Co., Ont.; not uncommon in mud and gravel along small rills and about springs around Victoria, Nanaimo and Nanaimo River, Vancouver Island; also by a little brook at Hastings, Burrard Inlet; and on the bank of the Columbia River at Revelstoke, B.C. (*Macoun.*)

(416.) **P. fontana,** Brid.; Lesq. & James, Mosses of N. America, 209; Canadian Musci, No. 153.

Bartramia fontana, Drumm. Musc. Bor.-Am., No. 241.

Pictou Co., N.S. (*McKay.*) Vicinity of New Harbor, Bay Bull Arm and Blaketown, Newfoundland. (*Rev. A. Waghorne.*) Springy places; Molus River, Kent Co., also at Fredericton, N.B. (*Fowler's Cat.*) Moist places, Tobique River, N.B. (*Hay.*) Very common at Canaan Forks and Tay, N.B. (*J. Moser.*) On wet rocks, Cap Rouge, Que. (*St. Cyr.*) Miquelon Island. (*Delàmare.*) In springs and by brooks and on wet rocks across the continent. At Truro and Straits of Canso, N.S.; bogs Tignish, Prince Edward Island; common on the Gaspé coast, Que.

at Ottawa and Lake Nipissing and on Gull Lake, Frontenac Co., Ont.; abundant at Lakes Superior and Nepigon and westward; at Hector, Rocky Mountains; Columbia Valley at Donald, and at the Asulcan Glacier, Selkirk Mountains; abundant at Revelstoke, on the Columbia River; in the Eagle Pass; at Quesnel on the Fraser; Hastings, and New Westminster, B.C.; abundant on Mount Benson and at Victoria, Vancouver Island. (*Macoun.*) Moist rocks, Crow's Nest Pass, Rocky Mountains and on the mountains at Adam's Lake, B.C.; alt. 5,000 feet. (*Dawson.*) On Mount Queest, Gold Range, B.C.; alt. 6,000 feet; Ounalaska, Behring Sea. 1891. (*J. M. Macoun.*) In springy wet places; common. (*Drummond.*) Rocky Mountains. (*Bourgeau.*) Chilwkweyuk, B.C. (*Lyall.*) Greenland. (*Fl. Gr.*)

Var. **brachyphylla,** Kindb. (n. var.)

In bogs, Brackley Point, Prince Edward Island. June 28th, 1888. (*Macoun.*)

Var. **serrata,** Kindb. (n. var.)

Swamps in Roger's Pass, Selkirk Mountains. August 24th, 1885. (*Macoun.*) In boggy soil at Ounalaska and Atkah islands, Behring Sea, 1891. (*J. M. Macoun.*)

Var. **microblasta,** C. M. & Kindb. (n. var.)

Male flowers very small, brown; perigonial leaves all acute, strongly costate.

On damp earth along the railway track, Roger's Pass, Selkirk Mountains, B.C., 30th July, 1890. (*Macoun.*)

Var. **Columbia,** Kindb. (n. var.)

Lower leaves narrow; costa long-excurrent, perigonial leaves acute, or subacute.

On wet rocks below the Illicillewaet Cañon, at Revelstoke, B.C., May 18th, 1890. (*Macoun.*)

(417.) **P. glabriuscula,** Kindb. (n. sp.); Canadian Musci, No. 578.

Webera fontana, Kindb., Ott. Nat. Vol. IV. 62.

Tufts radiculose below, 4 cm. high. Stem slender. Leaves small, green, distant, spreading and straight when moist, indistinctly decurrent, short ovate-lanceolate, short-acuminate, acute, slightly papillose, pellucid, plane at the margins, not plicate, minutely serrulate princi-

pally above ; cells oblong-hexagonal, the lower narrower, less chlorophyllose, costa subpercurrent. Habit of *Webera albicans.* Barren.

By springs in a gully, Canaan Forks, Queen's Co., N.B. January 2nd, 1890. (*J. Moser.*)

XV. MEESIEÆ.

70. CATOSCOPIUM, Brid.

(418.) **C. nigritum,** Brid.; Lesq. & James, Mosses of N. America, 211; Canadian Musci, No. 154.

Weisia nigrita, Drumm. Musc. Bor.-Am., No. 73.

Common in swamps in the Rocky Mountains. (*Drummond.*) In boggy meadows, Lake Superior. (*Agassiz.*) Common in boggy and springy places throughout Canada. Bogs at Salt Lake and Gunn River, Anticosti; quite common along the shore at Red Bay and Fishing Islands, Lake Huron ; wet rocks, shore of Lake Nepigon ; abundant at Stephen, Banff and Hector, Rocky Mountains ; in boggy soil near the Hot Springs, Kootanie Lake, B.C. ; abundant in springs, Hudson Hope, Peace River, lat. 56°. (*Macoun.*) Godhavn, Greenland. (*Fl. Gr.*)

71. AMBLYODON, Beauv.

(419.) **A. dealbatus,** Beauv.; Lesq. & James, Mosses of N. America, 211 ; Canadian Musci, No. 155.

Bryum dealbatum, Drumm. Musc. Bor.-Am., No. 249.

Canaan Forks and Tay, N.B. (*J. Moser*) Moist rocks among the Rocky Mountains; and about York Factory, Hudson Bay. (*Drummond.*) Peat bog near Ste. Anne des Monts, Gaspé Co., Que. (*J. A. Allen.*) Peat bog, Salt Lake, Anticosti ; also in a bog at Kingston, N.S. ; on clay around springs opposite Hudson Hope, Peace River, lat. 56° ; boggy places at Morley Station, on tufa mounds at Banff and by springs at Hector, Rocky Mountains. (*Macoun.*)

72. MEESIA, Hedw.

(420.) **M. uliginosa,** Hedw.; Lesq. & James, Mosses of N. America, 212 ; Canadian Musci, No. 156.

Bryum trichodes var. *longiseta,* Drumm. Musc. Bor.-Am., No. 247.

In swamps in the country extending from York Factory to the Rocky Mountains. (*Drummond.*) Peat bog near St. Anne des Monts,

Gaspé, Que. (*J. A. Allen.*) Boggy places at Truro, N.S.; wet bank of Jupiter River, Anticosti; along the Madeline and Fox rivers, Gaspé Co., Que.; marshes along Lake Huron at Red Bay, Bruce Co., Ont.; wet rocks, Lake Nepigon; peat bogs, House Mountain near Lesser Slave Lake, N.W.T.; swamps at Castle Mountain, Banff and Hector, Rocky Mountains; along the Columbia at Donald, B.C. (*Macoun.*) Boggy places at Dog Head, Lake Winnipeg; also on the Clearwater River, Athabasca. (*J. M. Macoun.*) Mooyie River, B.C. (*Lyall.*) Common; Greenland. (*Fl. Gr.*)

Var. **alpina,** Bruch & Schimp.

Bryum trichodes, Drumm. Musc. Bor.-Am., No. 245.

Marshes among the Rocky Mountains. (*Drummond.*) Swamps at Kicking Horse Lake, Rocky Mountains. (*Macoun.*) Summit of Mount Queest, Gold Range, B.C. (*J. M. Macoun.*)

Var. **minor,** Bruch & Schimp.

Bryum trichodes var. *minor,* Drumm. Musc. Bor.-Am., No. 246.

Moist places amongst the Rocky Mountains. (*Drummond.*) Ontario. (*Lesq. & James.*) Disco, Greenland. (*Fl. Gr.*)

(421.) **M. longiseta,** Hedw.; Lesq. & James, Mosses of N. America, 212.

Swamps, Queen's Co., N.B. (*McKay.*) Damp woods, Clifton, N.B. (*J. Wetmore.*) Abundant in a bog in Seymour West, Northumberland Co., Ont.; in bogs at the base of the Porcupine Mountains, Man. (*Macoun.*) Sabine Island, Greenland. (*Fl. Gr.*)

(422.) **M. Albertinii,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 213.

Bryum triquetrum, Drumm. Musc. Bor.-Am., No. 244.

Swamps at York Factory and Cumberland House, on the Saskatchewan. (*Drummond.*) Smith's Sound, between lat. 78°—82°. (*Dr. Hayes.*)

(423.) **M. tristicha,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 213; Canadian Musci, No. 157.

Swamps at Becscie River, Anticosti; abundant in a bog behind the Railway Station at Banff, and at Stephen, Rocky Mountains; in bogs at McLeod's Lake, lat. 55°, B.C. (*Macoun.*) In peat bogs between

Port Arthur and Fort William. (*Mrs. E. G. Britton.*) Lake Superior. (*Agassiz.*) Pack River, B.C. (*Lyall.*) Disco Island, Greenland. (*Fl. Gr.*) In wet woods near London, Ont. (*J. Dearness.*)

73. PALUDELLA, Ehrh.

(424.) **P. squarrosa,** Brid.; Lesq. & James, Mosses of N. America, 214; Canadian Musci, No. 158.

Bryum squarrosum, Drumm. Musc. Bor.-Am., No. 248.

Marshes near the Rocky Mountains; rare; and about York Factory. (*Drummond.*) Bogs, Salt Lake, Anticosti; summit of Mount Albert, Gaspé Co., Que.; in swamps at Stephen, Rocky Mountains; in peat bogs, Telegraph Trail, Blackwater River, B.C. (*Macoun.*) Mountains east of Adam's Lake, B.C.; alt. 6,500 feet. (*Dawson.*) Greenland. (*Fl. Gr.*)

XVI. BRYEÆ.

74. MIELICHHOFERIA, Hornsch.

(425.) **M. nitida,** Nees & Hornsch. Var **macrocarpa,** C. Muell.; Lesq. & James, Mosses of N. America, 215.

Weisia macrocarpa, Drumm. Musc. Bor.-Am., No. 74.

Upon slate rocks; among the Rocky Mountains. (*Drummond.*)

(426.) **M. cuspidifera,** Kindb. (n. sp.)

Differs from *M. nitida* in the leaves being broad-ovate, suddenly cuspidate, entire or slightly crenulate above, the cells a little wider and the costa often percurrent.

On damp rocks beside the torrent at Hector, Rocky Mountains, alt. 5,000 feet. August 11th, 1890. (*Macoun.*)

75. LEPTOBRYUM, Schimp.

(427.) **L. pyriforme,** Schimp.; Lesq. & James, Mosses of N. America, 215; Canadian Musci, No. 159.

Bryum pyriforme, Drumm. Musc. Bor.-Am., No. 271.

In burnt woods; frequent. (*Drummond.*) Pictou Co., N.S. (*McKay.*) Canaan Forks and Tay, N.B. (*J. Moser.*) On recently burnt soil, Bass River, N.B. (*Fowler's Cat.*) Shaded ground, Tobique River,

N.B. (*Hay.*) On earth in woods near Quebec. (*St. Cyr.*) On burnt and damp soil across the continent. Brackley Point, Prince Edward Island; woods, Salt Lake, Anticosti; Mount Albert, Gaspé Co., Que.; at Ottawa, Belleville, Owen Sound and Lake Nepigon, Ont.; Lake Manitoba, Man.; Moose Mountain, Assinaboia; Castle Mountain, Devil's Lake, Banff and Hector, Rocky Mountains; near Edmonton, Athabasca; Revelstoke, Sproat, Cache Creek, and Hastings, B.C.; common on Vancouver Island at Victoria and Naniamo. (*Macoun.*) Black River, Lake Winnipeg; Behring Island, Attu, and Cape Vancouver, Behring Sea. 1891. (*J. M. Macoun.*) Mountains south of Tulameen River, B.C.; alt. 5,000 feet. (*Dawson.*) Saskatchewan and Rocky Mountains. (*Bourgeau.*) Cascade Mountains. (*Lyall.*) Iktigalik. (*Roth. Alask.*) Greenland. (*Fl. Gr.*)

76. WEBERA, Hedw.

(428.) **W. acuminata,** Schimp.; Lesq. & James, Mosses of N. America, 216; Canadian Musci, No. 521.

On rocks at Bass River; and in Restigouche Co., N.B. (*Fowler's Cat.*) Quite common in crevices of rocks at the "Waterfall" at the base of Mount Sir Donald, opposite the Great Glacier, Selkirk Mountains. (*Macoun.*)

(429) **W. polymorpha,** Schimp.; Lesq. & James, Mosses of N. America, 216.

W. cucullata, Canadian Musci, No. 468, in part.

Sitka. (*Bischoff.*) On earth, mountains north of Griffin Lake, Gold Range, B.C.; alt. 7,000 feet. (*Macoun.*) Greenland. (*Fl. Gr.*)

(430.) **W. elongata,** Schwaegr; Lesq. & James, Mosses of N. America, 216.

Crevices of rocks, St. John, N.B. (*Fowler's Cat.*)

(431.) **W. polymorphoides,** Kindb. (n. sp.)

Tufts large and dense, dull green above, rufescent below, 4-5 cm. high. Stem finally denudate at the base, radiculose in the middle. Leaves crowded, not decurrent, ovate-oblong, acute or subobtuse, widely areolate, nearly entire and flat at the borders with the costa vanishing below the apex; the comal ones longer, sublinear-lanceolate short-acuminate with the upper cells narrow, the borders reflexed to the greater part; the costa thick and sub-percurrent. Capsule oblong,

short-necked, pendent; peristome pale-yellow, segments with a narrow basal membrane, cilia short and rudimentary; annulus narrow; lid mammillate; pedicel about 2 cm. long; spores brown, about 0.02 mm. Dicœcious.

This species is allied to *Webera polymorpha*, but is very much larger, in habit resembling *Webera longicolla*.

Close to the glacier on the western face of Hermit Mountain, Roger's Pass, Selkirk Mountains, B.C.; alt. 7,500 feet. August 1st, 1890. (*J. M. Macoun.*)

(432.) **W. longicolla,** Hedw.; Lesq. & James, Mosses of N. America, 217.

Cascade Mountains. (*Lyall.*) Common in Greenland. (*Fl. Gr.*)

(433.) **W. nutans,** Hedw.; Lesq. & James, Mosses of N. America, 217; Canadian Musci, No. 160.

Bryum nutans, Drumm. Musc. Bor.-Am., No. 262.

Dry woods; about the roots of trees. (*Drummond.*) Pictou Co., N.S. (*McKay.*) On rotten wood, Bass River, N.B. (*Fowler's Cat.*) Moist, rotten wood, Tobique River, N.B. (*Hay.*) On rotten wood Canaan Forks, Queen's Co., and Tay, York, Co., N.B. (*J. Moser.*) Miquelon Island. (*Delàmare.*) River du Loup (*en bas.*) (*St. Cyr.*) On very rotten logs and bases of stumps across the continent. Subject to many varieties. Brackley Point, Prince Edward Island; Truro, N.S.; Becscie River and South West Point, Anticosti; in woods, Gaspé Co., Que.; in woods around Ottawa; at Prescott, Belleville, Owen Sound, and Lake Nepigon, Ont.; Manitoba House, and Swan Lake, Man.; at Morley, Devil's Lake, Banff and Hector, Rocky Mountains; Roger's Pass, Selkirk Mountains; Revelstoke, Sproat, Nelson, Sicamous, Griffin Lake, Donald and Câche Creek Mountain, B.C.; near Edmonton, Athabasca. (*Macoun.*) Vicinity of London, Ont. (*J. Dearness.*) Swamps at Black River and Dog Head, Lake Winnipeg; Fort Simpson, B.C.; and Ounalaska and St. Paul islands, Behring Sea, 1891. (*J. M. Macoun.*) Mountains east of Adam's Lake, B.C.; alt. 6,600 feet. (*Dawson.*) Vicinity of New Harbor, Chance Cove and Topsail, Newfoundland. (*Rev. A. Waghorne.*) Saskatchewan River. (*Bourgeau.*) Cascade and Galton Mountains, B.C. (*Lyall.*) Kotzebue Sound, Sitka and Iktigalik. (*Roth. Alask.*) Hare Island, West Coast of Greenland. (*John Sadler.*) Smith's Sound, between lat. 78°—82°. (*Dr. Hayes.*) Greenland. (*Fl. Gr.*)

Var. **macrospora,** Kindb. (n. var.)

Leaves denticulate to the middle; costa excurrent. Spores large, about 0.03 mm.

Summit of the Gold Range north of Griffin's Lake, B.C.; alt. 7,000 feet. August 9th, 1889. (*Macoun.*)

(434.) **W. sphagnicola,** Schimp.; Lesq. & James, Mosses of N. America, 219.

In a peat bog at Kingston, N.S. (*Macoun.*) Disco, Greenland. (*Fl. Gr.*)

(435.) **W. cucullata,** Schimp.; Lesq. & James, Mosses of N. America, 218; Canadian Musci, No. 468, in part.

Mountains north of Griffin Lake, Gold Range, B.C.; alt. 7,000 feet, 11th August, 1889. (*Macoun.*) Greenland. (*Fl. Gr.*)

(436.) **W. canaliculata,** C. M. & Kindb. (n. sp.)

W. nutans var, *deflexa*, Kindb. (n. var.)
W. albicans var. *deflexa*, Bull. Torr. Bot. Club, XVII., 273.

Allied to *Webera nutans.* The median and comal leaves are longer-attenuate, denticulate sometimes below the middle, narrow-areolate, their costa is thick, canaliculate and excurrent; the comal ones revolute at the borders; only the lowest shorter and short-decurrent; the peristome is pale; lid low and flat.

On rocks, Vesuvius Bay, Salt Spring Island, Gulf of Georgia, B.C., May 10th, 1887. (*Macoun.*)

(437.) **W. subcucullata,** C. M. & Kindb. (n. sp.)

W. gracilis, Canadian Musci, No. 424.

This species which has the habit of *Mielichhoferia nitida*, seems to be intermediate between *Webera cucullata* and *Webera pycno-decurrens.* It resembles the last in the small compact tufts, the geniculate pedicel and the dicœcious inflorescence, the small, (unripe) short-necked capsule, and the mammillate lid; but the stems are subjulaceous, and the dull green leaves are densely crowded and not decurrent; the lower leaves are short and subobtuse, nearly as in *Webera cucullata* but the areolation is narrower.

Crevices of rocks, Mount Queest, Gold Range, B.C.; alt. 6,500 feet. July 27th, 1889. (*J. M. Macoun.*) Among debris near perpetual snow on mountains north of Griffin Lake, Gold Range, B.C.; alt. 7,000 feet. August 8th, 1889. (*Macoun.*)

(438.) **W. pycno-decurrens,** C. M. & Kindb. (n. sp.)

Tufts dense, glossy bright green, 1-1.5 cm. high. Fertile stem 0.3–0.5 cm. high. Leaves small, acute, the lower ovate-oblong, crowded but short-decurrent, the comal very much longer, sublanceolate, revolute at the borders for the greater part, denticulate above, the inner perichetial leaves very much shorter, looser areolate ; costa not excurrent. Capsule obovate, red-brown, distinctly short-necked, annulate, orange-margined at the mouth ; cilia sometimes appendiculate, inner membrane broad, teeth finally dark yellow ; lid convex, orange-margined, mammillate ; pedicel geniculate at the middle ; spores brown, small, about 0.01 mm. Dicœcious. This species resembles *Webera commutata* or rather *Webera Lescurii*, but seems to be quite distinct.

On earth amongst rocks, near perpetual snow on the Gold Range, north of Griffin Lake, B.C. ; alt. 7,000 feet. August 10th, 1889. (*Macoun.*)

(439.) **W. microcaulon,** C. M. & Kindb. (n. sp.)

Resembling a small form of *Webera polymorpha* in the very short (about 3 mm. long) stem and the leaves acute, agglomerate in small buds. Differs principally in the dicœcious inflorescence and the very large spores, unripe about 0.03 mm. The capsules (not ripe) are short-obovate, annulate, with a short neck and a low mammillate lid, the pedicel straight, arcuate at the apex, 1—1.5 cm. long, the comal leaves scarcely revolute at the borders, the inner perichetial much shorter. The tufts are very compact; the leaves green or finally blackish.

On Digge's Island, Hudson Strait. August, 1884. (*R. Bell.*)

(440.) **W. micro-denticulata,** C. M. & Kindb. (n. sp.)

Tufts dense, glossy green, about 3 cm. high. Leaves small, loose when dry open-erect, decurrent, short, ovate-oblong, nearly entire, more widely areolate with a red and not percurrent costa, the comal ones longer, lanceolate, acute or sub-obtuse, narrow-areolate, revolute at the borders nearly all around, faintly denticulate above, costa pale and sub-percurrent. Capsules small (not ripe) obovate, short-necked ; lid low mammillate. Dicœcious.

Probably allied to *Webera commutata*, Schimp., but differing principally in the distincter decurrent, loosely disposed leaves.

Close to perpetual snow on the Gold Range, north of Griffin Lake, B.C. ; alt. 7,000 feet. August 7th, 1889. (*Macoun*).

(441.) **W. micro-apiculata,** C. M. & Kindb. (n. sp.)

Tufts small, dense and shining, bright green above, decolorate below, about 2 cm. high. Leaves small; narrow-areolate, densely imbricate and appressed when dry; when moistened suberect, not decurrent, ovate-lanceolate with a needle-shaped, often incurved point, the lower nearly entire, the comal a little longer, faintly and distantly sinuolate-denticulate above, borders not revolute, costa not excurrent.

This species is very peculiar, but only found in a barren state. It resembles in habit a species of *Bryum* sect. *Anomobryum* also the pleurocarpous genus *Myurella.*

On damp rocks in Eagle Pass west of Revelstoke, B.C. May 23rd, 1890; also on wet rocks by the torrent at Hector, Rocky Mountains, August 13th, 1890. (*Macoun.*)

(442.) **W. Columbica,** Kindb. (n. sp.)

W. pulchella, Canadian Musci, No. 164.
Bryum carneum var. *pulchellum,* Drumm. Musc. Bor.-Am., No. 261, in part.

Differs from *W. pulchella* principally in the leaves being more denticulate at least in the middle, the red costa and the detached revoluble annulus of the capsule.

The leaves are slightly reflexed, not glossy; the capsule and the leaves are small, the segments furnished with 2 cilia.

Upon moist banks, not uncommon. (*Drummond.*) On earth in railway cuttings in Roger's Pass, Selkirk Mountains; both sides of the river at Revelstoke, along a brook at Yale, and at Hastings, Burrard Inlet, B.C.; also near Lesser Slave Lake, Athabasca; and along the Telegraph Trail near the Nechacco River, B.C. (*Macoun.*)

(443.) **W. pulchella,** Schimp.; Lesq. & James, Mosses of N. America, 222.

Cascade Mountains of British Columbia. (*Mitten.*) On debris at Donald, Columbia Valley. (*Macoun.*)

(444.) **W. Lescuriana,** Lesq. & James, Mosses of N. America, 221; Canadian Musci, No. 163, in part.

On the ground, by roadsides, Bass River, N.B. (*Fowler's Cat.*) Wet places at Truro, N.S. (*Macoun, J. Moser.*)

(445.) **W. carnea,** Schimp.; Lesq. & James, Mosses of N. America, 221; Canadian Musci, No. 163, in part.

Wet springy places at Truro, N.S.; also by roadsides in wet soil at

Brackley Point and Black River, Prince Edward Island ; on earth in Northern British Columbia. 1875. (*Macoun.*)

(446.) **W. cruda,** Schimp. ; Lesq. & James, Mosses of N. America, 218 ; Canadian Musci, No. 161.

Bryum elongatum, Drumm. Musc. Bor.-Am., No. 270.
B. lucidum, James, Plantæ Kaneanæ.

Banks, amongst the Rocky Mountains. (*Drummond.*) Bass River, Kent Co., N.B. (*Fowler's Cat.*) Crevices of rocks, Canaan Forks, N.B. (*J. Moser.*) Crevices of rocks, rather common across the continent. Brackley Point and Pointe de Roche, P.E.I. ; Pirate's Cove, N.S. ; Madeline River, Gaspé Co., Que. ; shores of lakes Superior, Nipissing, and Nepigon, Ont. ; Pembina River, Athabasca ; Peace River Cañon, lat. 56° ; at Castle Mountain and Hector, Rocky Mountains ; Roger's Pass, Selkirk Mountains ; Revelstoke, and Pass Creek, Columbia River ; Câche Creek Mountain and Lytton, Fraser River, B.C. ; near Victoria and on Mount Benson, Vancouver Island. (*Macoun.*) Summit of Mount Queest, Gold Range, B.C. ; Ounalaska Island, Behring Sea. 1891. (*J. M. Macoun.*) New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Cascade Mountains, B.C. (*Lyall.*) Iktigalik. (*Roth. Alask.*) Smith's Sound, between lat. 78°—82°. (*Dr. Hayes.*) West Greenland and Smith's Sound. (*Dr. Kane.*)

(447.) **W. Schimperi,** (C. Müell.) Schimp. ; Fl. Greenland, 374.

B. rutilans, Bruch & Schimp. ; Dr. Hayes, Exp.

Smith's Sound between lat. 78°—82°. (*Dr. Hayes.*) Clavering and Sabine Islands. (*Fl. Gr.*)

(448.) **W. annotina,** Schwaegr ; Lesq. & James, Mosses of N. America, 219 ; Canadian Musci, No. 162.

Pictou Co., N.S. (*McKay.*) River du Loup (*en bas*), Que. (*St. Cyr.*) North Bay Lake Nipissing, Ont. ; shore of Lake Winnipegoosis, Man. ; by springs along the Athabasca River, at Fort Assiniboine ; on earth near Asulcan Creek, and along Beaver Creek, Selkirk Mountains ; common around springs at Victoria, Vancouver Island. (*Macoun.*) Sabine Island and Disco. (*Fl. Gr.*)

(449.) **W. Drummondii,** Lesq. & James, Mosses of N. America, 319.

B. carneum var. *pulchellum*, Drumm. Musc. Bor.-Am., No. 261, in part.
Bryum nutans var. *minor*, Drumm. Musc. Bor.-Am., No. 263.

Sitka. (*Harrington.*) Summit of the Rocky Mountains ; in moist places (263) ; upon moist banks (261). (*Drummond.*)

(450.) **W. commutata,** Schimp.; Lesq. & James, Mosses of N. America, 220; Canadian Musci, No. 423.

Summit of Mount Albert, Gaspé Co., Que.; alt. 4,000 feet; wet gravel in Roger's Pass, and along Asulcan Creek, and at the Glacier on Hermit Mountain, Selkirk Mountains. (*Macoun.*)

(451.) **W. Ludwigii,** Schimp., Synops. ed. 2.

Bryum Breidleri, Canadian Musci, No. 425.
Webera Breidleri, Jur.

Cascade Mountains, B.C. (*Lyall.*) Not uncommon in Greenland. (*Fl. Gr.*) Near the limit of perpetual snow; on the summit of the Gold Range, north of Griffin Lake, B.C.; alt. 7,000 feet. (*Macoun.*)

Var. **microphylla,** Kindb. (n. var.)

Differs principally in the very much smaller leaves. Barren.
On the summit of the Gold Range north of Griffin Lake, B.C.; alt. 7,000 feet, August 7th, 1889. (*Macoun.*)

(452.) **W. albicans,** Schimp.; Lesq. & James, Mosses of N. America, 222; Canadian Musci, No. 165.

Bryum carneum, Drumm. Musc. Bor.-Am., No. 260.

Near springs amongst the Rocky Mountains. (*Drummond.*) Springy places, Windsor, N.S. (*Fowler's Cat.*) Wet earth at New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Pictou Co., N.S. (*McKay.*) River du Loup (*en bas*), Que. (*St. Cyr.*) Canaan Forks, Queen's Co., boggy places, York Co., N.B. (*J. Moser.*) On wet rocks at Trenton, and Heely Falls, Northumberland, Co., Ont.; Sydenham Falls, Owen Sound, Ont.; and around springs, Lake Nepigon; abundant at Hector and Banff, Rocky Mountains; quite common, Roger's Pass and along Asulcan Creek, Selkirk Mountains; by springs at Revelstoke, Columbia River; mountains at Griffin Lake, Gold Range; and by the Fraser River above Yale, B.C. (*Macoun.*) In wet places at London, Ont. (*J. Dearness.*) Galton Mountains, B.C. (*Lyall.*) Jakobshavn, Greenland. (*R. Brown.*)

(453.) **W. Tozeri,** Schimp.; Lesq. & James, Mosses of N. America, 222; Canadian Musci, No. 188.

On clayey soil along Shawnagin Lake, and at Goldstream, Vancouver Island. 1887. (*Macoun.*)

77. BRYUM, Dill.

(454.) **B. arcticum,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 224.

On the summit of Mount Albert, Gaspé Co., Que.; House Mountain south of Lesser Slave Lake, N.W.T. (*Macoun.*) Melville Island. (*Parry.*) Rocky Mountains. (*Bourgeau.*) Smith's Sound, between lat. 78°—82°. (*Dr. Hayes.*) Clavering Island, Upernivik. (*Fl. Gr.*)

(455.) **B. erubescens,** Kindb. (n. sp.)

Stems short, scarcely 1 cm. high, loosely tufted. Leaves of the innovations green and small; stem-leaves few, red-brown, not decurrent, ovate-lanceolate acuminate, red-margined, not revolute at the entire borders; areolation pellucid, decolorate, upper cells narrow-rhomboidal or hexagonal; costa red, more or less excurrent; inner perichetial leaves smaller, immarginate, slightly sinuolate above with a percurrent costa. Capsule small, regular, pendent, narrow-oblong, constricted below the mouth; cilia appendiculate; lid convex, mammillate; pedicel thin, pale red, 2-3 cm. long. Spores extraordinarily large, about 0·03 mm. Dicœcious.

This species having the habit of a *Webera* (*W. acuminata* or *W. polymorpha*), has no affinity to the other *Eubrya*, found in Canada. The small reddish leaves and the large spores distinguish it at once. It grows mixed with *Amblystegium porphyrhizon.*

On the roots of a turned-up tree close to the discharge of Lake Louise, Rocky Mountains (No. 178). August 18th, 1891. (*Macoun.*)

(456.) **B. hæmatophyllum,** Kindb. (n. sp.); Canadian Musci, No. 555.

Stems short, about 1 cm. high, loosely tufted or solitary. Leaves small, red, densely crowded, not decurrent, ovate or ovate-oblong, acute, indistinctly margined, reflexed at the entire borders; areolation red, nearly uniform and loose; costa very broad, not, or very short, excurrent; perichetial leaves oblong-lanceolate. Capsule (not ripe) regular, pendent, obovate; lid convex, short-apiculate; pedicel thin, 1–2 cm. long. Spores small. Dicœcious.

This species, probably belonging to the section *Eubryum*, is peculiar in the thick and broad costa of the red and short leaves.

On wet rocks in the "Dry Cañon" near the discharge of Devil's Lake, Rocky Mountains (No. 104). August 10th, 1890. (*Macoun.*)

No. 164, collected in the same locality seems to belong here, but the single unripe capsule has a mammillate lid.

(457.) **B. purpurascens,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 224.

Melville Island. (*Parry.*) Rocky Mountains. (*Bourgeau.*) Rainy Lake, British America. (*Hubbard.*) Smith's Sound between lat. 78°—82°. (*Dr. Hayes.*) Common in Greenland. (*Fl. Gr.*) Labrador. (*Gremann* fide *Kindberg.*)

(458.) **B. subpurpurascens,** Kindb. (n. sp.); Canadian Musci, No. 593.

Agreeing with *B. purpurascens* in the red tufts, the elongate shoots, the costa scarcely or faintly excurrent, the capsule long-necked, constricted below the mouth, teeth orange-colored, segments free, cilia smooth, spores small, lid large, mammillate, pedicel red; differs in the inflorescence being dicœcious, all leaves red-margined, long-excurrent, and principally in the curved subclavate capsule, resembling that of *Bryum meeseoides.*

On wet earth by the railway at Port Moody, Burrard Inlet, B.C., April 23rd, 1889. (*Macoun.*)

(459.) **B. Brownii,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 224.

Melville Island. (*Parry.*) Rocky Mountains. (*Bourgeau.*) Franz Josephs Fjord, Greenland. (*Fl. Gr.*)

(460.) **B. pendulum,** Schimp.; Lesq. & James, Mosses of N. America, 225; Canadian Musci, No. 167.

New Harbor, Newfoundland. (*Rev. A. Waghorne.*) On rotten wood, Bass River, Kent Co. and Carleton, N.B. (*Fowler's Cat.*) Cape Prince of Wales and Digge's Island, Hudson Strait. (*R. Bell.*) Crevices of rocks, Salt Lake, Anticosti; also at Campbellton, N.B.; on earth at Ottawa, and along the shore of Lake Huron; also at Swan Lake House, Man,; on rocks, Kananaskis Falls, Bow River Pass and Banff, Rocky Mountains; Stewart's Lake and Nechacco River, B.C. (*Macoun.*) Clearwater River, N.W.T.; and St. Paul Island, Behring Sea. (*J. M. Macoun.*) Upernivik, Greenland. (*Fl. Gr.*)

(461.) **B. angustirete,** Kindb. Bull. Torr. Bot. Club, Vol. XVI. 94.

Differs from *B. pendulum* in the leaves being narrow, ovate-lanceolate, reflexed all around; upper areolation very narrow, sublinear, basal cells reddish; costa red. Capsule sub-cylindric; pedicel arcuate above; teeth paler; spores small, scarcely 0.02 mm. Syncœcious.

On damp earth at the railway bridge over the Kananaskis, Rocky

Mountains ; on wet rocks at the outlet of the Illcillewaet Canōn, near Revelstoke, B.C., May 18th, 1890. (*Macoun.*)

(462) **B. archangelicum,** Schimp.

On earth along the Ste. Anne des Monts River at the base of Mount Albert, Gaspé Co., Que., August 26th, 1882 ; on damp rocks at Hector, Rocky Mountains. (*Macoun.*) Sabine Island. (*Fl. Gr.*)

(463.) **B. inclinatum,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 225 ; Canadian Musci, No. 381.

Miquelon Island. (*Delàmare.*) On damp, sandy soil, Brackley Point, Prince Edward Island and at Truro, N.S. ; on earth along the Gaspé coast, Que. ; on rocks near the " Gap," Bow River Pass and Banff, Rocky Mountains. (*Macoun.*) Mansfield Island, Hudson Strait. (*R. Bell.*) Kotzebue Sound. (*Roth. Alask.*) Kadiak Island, Alaska, and Ounalaska, Behring Sea. (*J. M. Macoun.*) Jakobshavn, Greenland. (*R. Brown.*)

(464.) **B. Froudei,** Kindb. Ott. Nat. Vol. V., p. 180.

Habit of *Webera nutans.* Agrees with *Bryum inclinatum* in the synœcious inflorescence and the symmetric capsule, &c., differs in the leaves being long-acuminate, cells long and narrow, the upper sublinear (nearly as in *Webera*), costa very long-excurrent, peristomial segments quite free from the teeth, spores smaller, scarcely 0.02 mm. ; the cilia are wanting.

St. Paul Island, Behring Sea, July 30th, 1891. (*J. M. Macoun.*)

(465.) **B. Edwardsianum,** C. M. & Kindb. (n. sp.)

B. Warneum, Canadian Musci, No. 383.

Nearly allied to *Bryum Warneum,* agreeing in the peculiar peristome and the very large spores, about 0.05 mm., &c., but differing principally in the leaves being longer acuminate, entire, revolute at the borders, the costa long-excurrent, the capsule narrower and the lid lower ; flagelliform branches absent. Monœcious.

On damp, sandy soil close to the sands of Brackley Beach, Prince Edward Island, July 7th, 1888. (*Macoun.*)

(466.) **B. brachyneuron,** Kindb. Ott. Nat. Vol. V., p. 180.

Agrees with *Bryum pendulum* in the synœcious inflorescence, the peristomes orange, the segments adhering to the teeth, the apiculate

lid and large spores (about 0.04 mm.); differs in the leaves being decurrent, short-ovate, the costa broad, abbreviate, not excurrent, the shoots bearing globose buds (gemmæ), the very much broader peristomial teeth. Stem red, very short; the pedicel about 1 cm. long or shorter, often scarcely emerging above the tufts; costa of the lowest leaves red, percurrent only in the leaves of the shoots and the perichetial ones; capsule ventricose, short-necked, constricted below the mouth.

Bryum fallax, Milde, resembling it in habit, is dicœcious; the segments are free, the spores smaller. *Bryum lacustre* differs in the not decurrent leaves, the capsule not constricted below the mouth, the pedicel is longer and the peristome is pale, &c.

St. Paul Island, Behring Sea. 1891. (*J. M. Macoun.*)

(467.) **B. fallax,** Milde, Bryol. Siles.

St. Matthew Island, Behring Sea, August 10th, 1891. (*J. M. Macoun.*)

(468.) **B. lacustre,** Brid.; Lesq. & James, Mosses of N. America, 226.

Peninsula of Shumagin, Alaska. (*Harrington.*) Kotzebue Island. (*Roth. Alask.*) Greenland. (*Fl. Gr.*)

(469.) **B. flexuosum,** Aust.; Lesq. & James, Mosses of N. America, 227.

Wet gravelly ground along the Blackwater River; also at Quesnel on the Fraser River, and at Stewart's Lake, B.C. (*Macoun.*)

(470.) **B. calophyllum,** R. Brown; Lesq. & James, Mosses of N. America, 227.

Melville Island. (*Parry.*) Greenland. (*Fl. Gr.*)

(471.) **B. œneum,** Blytt., Bryol. Europ.; Greenland Flora, 367.

Smith's Sound, between lat. 78°—82°. (*Dr. Hayes.*) Clavering and Sabine Island. (*Fl. Gr.*)

(472.) **B. uliginosum,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 227; Canadian Musci, No. 168.

Wet places, Gunn River, Anticosti; Sugar Loaf Mountain, Campbellton, N.B.; wet rocks, Gaspé Coast, Que.; and along the shores of Lake Superior and westward to Rainy Lake; House Mountain, near Lesser Slave Lake; on earth along the Blackwater River, B.C.

(*Macoun.*) On wet rocks, River du Loup (*en bas*), Que. (*St. Cyr.*) Tay, York Co., N.B. (*J. Moser.*)

(473.) **B. Labradorense,** Philib. revue-byrol. 1889, p. 61.

Allied to *Bryum inclinatum;* also found in Norway. Labrador, (*Gremann* fide *Philibert.*)

(474.) **B. intermedium,** Brid.; Lesq. & James, Mosses of N. America, 228; Canadian Musci, No. 169.

B. occidentale, Canadian Musci, No. 390.

Grand Falls of Nipisiquit, N.B. (*Fowler's Cat.*) Crevices of rocks, chiefly limestone, across the continent. At Truro, N.S.; Brackley Point, Prince Edward Island; along the Moira River at Belleville. Ont.; along Lake Nepigon and Lake Superior; also at Lake Winnipegoosis, Man.; on the Pembina River, west of Edmonton, Athabasca; Cypress Hills, Alberta; wet rocks, "Dry Cañon," discharge of Devil's Lake, Rocky Mountains; Blackwater River and Spence's Bridge, B.C.; quite common at Comox and Victoria, Vancouver Island. (*Macoun.*) In woods at Kingston, Ont. (*Prof. Fowler.*) On Mansfield Island, Hudson Strait. (*R. Bell.*) In rocky places at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) At New Harbor, Pickle Harbor and Norman Cove, Newfoundland. (*Rev. A. Waghorne.*) Greenland. (*Fl. Gr.*)

* **B. mamilligerum,** Kindb. (n. sub-sp.)

Differs from *Bryum intermedium* in the leaves being distinctly margined, nearly flat on the borders; capsule oblique, distinctly constricted below the mouth, often horizontally patent; lid mammillate, not apiculate; spores larger, about 0.025 mm.; stem very short, 1-2 mm.

On damp rocks in the "Dry Cañon," near the discharge of Devil's Lake, Rocky Mountains, August 10th, 1891. (*Macoun.*)

(475.) **B. cirrhatum,** Hoppe & Hornsch.; Lesq. & James, Mosses of N. America, 228.

On rocks along the Gaspé Coast, Que. (*Macoun.*) Crevices of rocks near the summit of Mount Queest, B.C. (*J. M. Macoun.*) Miquelon Island. (*Delàmare.*) Newfoundland (?) (*Rev. A. Waghorne.*) Greenland. (*Fl. Gr.*)

Var. **megalosporum,** Kindb. (n. var.)

Differs principally in the large spores, about 0.03 mm.

On wet soil on rocks, North Arm, Burrard Inlet, B.C., April 29th, 1889. (*Macoun.*)

(476.) **B. nitidulum,** Lindb. ; Fl. Greenland, 367.

Upernivik, Jakobshavn, Greenland. (*Fl. Gr.*)

(477.) **B. bimum,** Schreb. ; Lesq. & James, Mosses of N. America, 229 ; Canadian Musci, No. 170.

B. turbinatum, Drumm. Musc. Bor.-Am., No. 266.

Common in marshes ; and upon moist banks. (*Drummond.*) St. John and New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Borders of swamps, Bass River and St. John, N.B. (*Fowler's Cat.*) In Halifax and Pictou counties, N.S. (*McKay.*) Wet woods at Canaan Forks, and boggy places at Elmwood, York Co., N.B. (*J. Moser.*) Common near London, Ont. (*J. Dearness.*) Quite common in marshy spots in woods across the continent. Swamps, Straits of Canso, N.S. ; in woods, Gaspé coast, Que. ; common at Ottawa and Belleville, Ont. ; also in swamps, North Bay, Lake Nipissing, and at Nepigon, Lake Superior ; on earth, Manitoba House, Man. ; also at McLeod's Lake and Agassiz, B.C. ; common at Victoria, Vancouver Island. (*Macoun.*) Saskatchewan and Rocky Mountains. (*Bourgeau.*) Galton Mountains, B.C. (*Lyall.*) Franz Joseph Fjord. (*Fl. Gr.*)

Var. **angustifolium,** Kindb. (n. var.)

Leaves narrow, loosely disposed ; pedicel shortly emerging above the innovations ; stem 5 cm. high.

On wet rocks at Cape Vincent, near Kingston, Ont., June 1st, 1881. (*Prof. James Fowler.*)

(478.) **B. microstegium,** Bryol. Europ. ; Fl. Greenland, 368.

Godhavn and Holstenberg, Greenland. (*Fl. Gr.*)

(479.) **B. leucolomatum,** C. M. & Kindb. (n. sp.); Canadian Musci, No. 543.

Nearly allied to *Bryum bimum ;* differs principally in the stem being more robust and elevate, above 8 cm. high, the leaves pale-bordered, the inner perichetial ones cuspidate. The capsules are not ripe, the lid is whitish, apiculate, the pedicel 3-4 cm. long, the inflorescence synœcious.

In a small marsh on the slope of the mountain at Revelstoke, B.C., May 17th, 1890. (*Macoun.*)

(480.) **B. pallescens,** Schleich. ; Lesq. & James, Mosses of N. America, 231 ; Canadian Musci, No. 172.

Miquelon Island. (*Delàmare.*) Newfoundland (?) (*Rev. A. Wag-*

horne.) On earth, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On earth, near Belleville, Hastings Co., and at Lake Nepigon, Ont.; and at Banff and Hector, Rocky Mountains; on damp rocks at Deer Park, Lower Arrow Lake, Columbia River, near McLeod's Lake, lat. 55°. and Sicamous, B.C. (*Macoun.*) Cascade Mountains. (*Lyall.*) Greenland. (*Fl. Gr.*)

Var. **laxifolium,** Kindb., Bull. Torr. Bot. Club, XVII., 274.

Leaves loose, not glossy, long and narrow; upper cells narrow; spores small, about 0.01 mm.

Kananaskis Pass, Rocky Mountains, in damp woods, June 23rd, 1885. (*Macoun.*)

Var. **longifolium,** Kindb., Bull. Torr. Bot. Club, XVII. 274.

Leaves dense, glossy, very long-attenuate; upper cells narrow; spores small.

Wet gravelly soil at Morley, Rocky Mountains, June 13th, 1885. (*Macoun.*)

(481.) **B. teres,** Lindb.; Fl. Greenland, 369.

Franz Joseph Fjord and Sabine Island. (*Fl. Gr.*)

(482.) **B. subrotundum,** Brid.; Lesq. & James, Mosses of N. America, 231; Canadian Musci, No. 458.

Mountains of Canada. (*Drummond.*) On dry earth by a brook at Lytton, B.C. (*Macoun.*) Greenland. (*Fl. Gr.*)

(483.) **B. Knowltoni,** Barnes, Coult. Bot. Gaz. XVI., 44.

Crevices in rocks, Funk Island, Newfoundland, August, 1887. (*F. H. Knowlton.*)

(484.) **B. micro-erythrocarpum,** C. M. & Kindb. (n. sp.)

B. murale, Canadian Musci, No. 186.

Nearly allied to *B. erythrocarpum;* differs in the shorter stem; the leaves distinctly yellow-margined, laxer areolate, the costa sometimes excurrent, the capsule more ventricose, constricted below the mouth, the lid longer-apiculate.

In wet gravel, shore of Shawnigan Lake, Vancouver Island, July 1st, 1887. (*Macoun.*)

(485.) **B. atropurpureum,** Wahl.; Lesq. & James, Mosses of N. America, 232.

On earth at Foster's Flats below Niagara Falls, Ont. (*Macoun.*)

(486.) **B. Blindii,** Bruch & Schimp.; Canadian Musci, No. 502.

On damp earth in railway ditches a little east of Hector, Rocky Mountains; also on debris at the mouth of Six-Mile Creek, Selkirk Mountains, B.C. (*Macoun.*)

(487.) **B. alpinum,** Linn.; Lesq. & James, Mosses of N. America, 233.

On wet earth at Port Moody, Burrard Inlet, B.C., April 24th, 1889. (*Macoun.*)

(488.) **B. Raui,** Aust., in Coult. Bot. Gaz. II., 110; Canadian Musci, No. 480.

B. Muehlenbeckii, Lesq. & James, Mosses of N. America, 233 (Belleville specimen); Canadian Musci, No. 174.

Boggy places, Truro, N.S.; on rocks, Gull Lake, Addington Co.; and along the Moira at Belleville, Hastings Co., Ont.; on rocks, Lake Nepigon; on rocks at Spray Falls, Banff, Rocky Mountains; on wet rocks, Eagle Pass, west of Revelstoke, and at Agassiz, B.C. (*Macoun.*)

(489.) **B. Muehlenbeckii,** Bruch & Schimp; Bryol. Europ.; Fl. Greenland, 369.

Proven, Greenland. (*Dr. Kane.*) Topsail Harbor, Newfoundland (*Rev.. A. Waghorne.*)

(490.) **B. hæmatocarpum,** C. M. & Kindb. (n. sp.); Canadian. Musci, No. 555.

Tufts very tomentose below the green innovations, about 5 cm. high. Leaves loosely appressed, when dry slightly corrugate but not twisted, crowded, not decurrent, subovate, acute, pellucid, narrow-marginate and revolute at the entire borders all around, those of the innovations less distinctly revolute and marginate to above the middle; cells pale yellow, the upper short-rhomboidal; costa yellow, percurrent or in the upper-most leaves slightly excurrent. Capsule large (as in *Bryum pallescens*), suboblong-cylindric, blood-red, doubly longer than the pale collum, pendent or patent, not appressed to the pedicel; peristome dark-yellow or orange below, pale above; segments free and very much shorter than the membrane; cilia faintly appendiculate or

rather nodose; annulus broad; lid nearly flat and apiculate; pedicel red, flexuous, about 2-5 cm. long; spores small, about 0.018 mm. Dicœcious.

This remarkable species is a true *Eubryum*, although the peristomial cilia are not distinctly, or only at the base, appendiculate. It resembles *Bryum alpinum* in the color of the capsule, but is very different in the shorter, margined leaves and their wider areolation, the tomentose tufts, &c.

On damp rocks on the mountain between Pass Creek and the Columbia River above Sproat, June 19th, 1890. (*Macoun.*)

(491.) **B. pygmæo-alpinum,** C. & M. Kindb. (n. sp.)

Tufts dense and small, about 1 or 1.5 cm. high. Stem sparingly radiculose to the buds. Leaves small, olive-green or finally reddish, flaccid, not glossy, laxly areolate, hyaline; the uppermost close, the other loosely disposed, not decurrent, very much smaller, all subovate or oval obtuse, the uppermost sometimes subacute; borders not margined nor revolute; upper cells short-rhomboidal; costa broad, purplish, percurrent or in the uppermost leaves slightly excurrent. Barren.

This species is probably allied to *Bryum calophyllum* or to *Bryum obtusifolium*, Lindb. On wet rocks, summit of Mount Arrowsmith, Vancouver Island, alt. 5,700 feet, July 17th, 1887. (*Macoun.*)

(492.) **B. percurrentinerve,** Kindb.

B. percumcentinerve, Kindb., Bull. Torr. Bot. Club. XVII., 274; Canadian Musci, No. 505.

Tufts compact, dull green above, decolorate below, about 2 cm. high. Leaves, when dry, appressed and corrugate, when moistened subpatent, crowded and slightly decurrent, ovate obtusate (only the uppermost ovate-oblong and subacute), narrow-margined and revolute at the entire borders to the greater part; areolation pellucid, upper cells wide, sub-rhomboidal; costa red and percurrent, in the uppermost leaves pale.

Allied to *Bryum Muehlenbeckii*, but differing principally in the color of the plant, the leaves thinner, broader and shorter, at the apex patent or sometimes reflexed, not cucullate.

On dripping rocks on the face of a small waterfall in a brook just west of the ferry at Kamloops, B.C., June 18th, 1889. (*Macoun.*)

(493.) **B. miniatum,** Lesq.; Lesq. & James, Mosses of N. America, 233.

On wet rocks on Sproat Mountain, Columbia River, B.C. (*Macoun.*)

(494.) **B. capitellatum,** C. M. & Kindb. (n. sp.)

B. miniatum, Canadian Musci, No. 175, in part.

Tufts small compact, yellowish green above, reddish-rufescent below. Stems (primary branches) subjulaceous, clavate, acute, radiculose at the base, about 1 cm. high; innovations short. Leaves gradually larger upwards, not decurrent, very concave, not margined nor revolute at the entire borders; areolation wide and pellucid, upper cells sub-rhomboidal, the lower sub-rectangular; the lowest leaves very small, short-elliptic and blunt, loosely disposed, the other crowded, the median suboval and blunt, the uppermost ovate-oblong, subacute; costa finally red, percurrent in the upper leaves, abbreviate in the lower. Barren.

Probably allied to *Bryum Atwateriæ* and *B. miniatum*, which both differ in the leaf-cells being narrower and yellow, the leaves obtuse and cucullate at the apex, faintly revolute at the borders below the middle; the last has smaller leaves and shorter marginal cells.

Borders of ditches at Comox, Vancouver Island, April 30th, 1887. (*Macoun.*)

(495.) **B. Atwateriæ,** C. Muell.; Lesq. & James, Mosses of N. America, 234; Canadian Musci, No. 176.

B. Macounii, Aust. in Coult. Bot. Gaz. II. 110.

On wet rocks along Gull Lake, Addington Co., Ont.; abundant on wet rocks, Sproat Mountain, Columbia River; wet rocks, North Arm, Burrard Inlet, B.C.; Mount Erskine, Salt Spring Island, Gulf of Georgia; abundant on wet rocks near Victoria and at Comox, Vancouver Island; also on wet rocks along Stewart's River, northern British Columbia. (*Macoun.*)

(496.) **B. argenteum,** Linn.; Lesq. & James, Mosses of N. America, 234; Canadian Musci, No. 177; Drumm. Musc. Bor.-Am., No. 251.

Common in various situations. (*Drummond.*) On earth or stones, Truro, N.S. (*Fowler's Cat.*) Common on earth by roadsides and paths, and on bare rocks, chiefly the var. *lanatum*. Quite common in Ontario and westward. On earth, Manitoba House, Lake Manitoba, Man.; also at Edmonton, Athabasca; and McLeod's Lake, lat. 55°; and at Cache Creek, B.C. (*Macoun.*) Very common on sandy soil at London, Ont. (*J. Dearness.*) New Harbor and Chance Cove, Newfoundland. (*Rev. A. Waghorne.*) Rocky Mountains. (*Bourgeau.*) Disco Island, Greenland. (*Fl. Gr.*) Iktigalik, Alaska. (*Roth. Alask.*) St. Paul Island, Behring Sea. 1891. (*J. M. Macoun.*)

Var. **lanatum,** Bruch & Schimp.

Common on earth at Ottawa, Belleville and Owen Sound, Ont.; Cove Head, Prince Edward Island; on rocks at Morley, Rocky Mountains; and at Revelstoke and Deer Park on the Columbia River, B.C. (*Macoun.*) On sandy knolls at London, Ont. (*J. Dearness.*)

(497.) **B. cæspiticium,** Linn.; Lesq. & James, Mosses of N. America, 235; Canadian Musci, No. 178.

Chance Cove, Newfoundland; Fox Harbor and Vesuvius Pickle, Labrador. (*Rev. A. Waghorne.*) On dry ground, Bass River, N.B. (*Fowler's Cat.*) On earth, Queen's Co., N.B. (*J. Moser.*) Halifax and Pictou counties, N.S. (*McKay.*) River du Loup (*en bas,*) Que. (*St. Cyr.*) Common on earth in open places in woods and in pastures across the continent. Brackley Point and Cove Head, Prince Edward Island; at Ste. Anne des Monts, Gaspé Co., Que.; abundant at Ottawa and Belleville, Ont.; amongst rocks at Lake Nepigon; in pastures, where water has stood, at Morley and Banff, Rocky Mountains; in Roger's Pass, Selkirk Mountains; also at Revelstoke, Deer Park, Câche Creek, Spence's Bridge and Lytton, B.C.; north of Edmonton, Athabasca. (*Macoun.*) On logs at Lobourough Lake, near Kingston, Ont. (*Prof. Fowler.*) Little Whale River, Hudson Bay. (*G. Barnston.*) Clearwater River, N.W.T., lat. 57°. (*J. M. Macoun.*) Jakobshavn, Greenland. (*B. Brown.*) Big Duck Island, Baffins' Bay. (*J. Sadler.*)

(498.) **B. synoico-cæspiticium,** C. M. & Kindb. (n. sp.); Canadian Musci, No. 513.

Tufts dense, about 1 cm. high, radiculose only at the base, green above, brown-decolorate below. Leaves erect, not decurrent, subovate, acuminate, not margined, recurved at the borders, slightly denticulate above; costa long-excurrent, very rigid, thick and often denticulate, light-brown. Capsule turgid, oval, very short-necked, not, or slightly, constricted below the mouth, pendent; peristome perfect; lid low and umbonate; spores about 0.015 mm.; pedicel geniculate below the middle, arcuate at the apex, about 5 cm. long, thick and red. Synœcious.

This species is very different from the allied *Bryum cæspiticium* in the synœcious inflorescence, the larger spores and the long, geniculate pedicel of the capsule.

On earth amongst gravel in the old channels of the Illecillewaet River below the Cañon at Revelstoke, B.C., May 27th, 1890. (*Macoun.*)

(499.) **B. Vancouveriense,** Kindb., Bull. Torr. Bot. Club, XVI., 95; Canadian Musci, No. 457.

Differs from *B. cæspiticium* in the leaves being longer acuminate, at the base red, and reflexed only below the middle; cells small, upper very narrow; costa very thick, excurrent in most of the leaves; capsule not pendent and not constricted below the mouth, lid deplanate; spores larger, about 0.015 mm.; stem indistinct with gemmiform innovations; pedicel very long, 4-5 cm.

On wet slopes of Mount Finlayson at Goldstream, Vancouver Island, June 28th, 1887. (*Macoun.*)

(500.) **B. microglobum,** C. M. & Kindb. (n. sp.)

Tufts compact, green, radiculose below, small and about 1 cm. high; branches very short, bearing small buds. Leaves narrow-margined, subentire: stem-leaves ovate-oblong and short-acuminate, faintly revolute at the borders, branch-leaves ovate-acute and not revolute; upper cells short except the narrow marginal ones; costa more or less short-excurrent. Capsule small, inclined, pale, globose-pyriform small-mouthed; peristome perfect; teeth pale; cilia short but appendiculate; lid convex with a conical mammilla; pedicel arcuate at apex, about 3 cm. long. Dicœcious.

This species has the habit of *Bryum Warneum*, also in the shape of the capsule, but it is a true *Eubryum* with appendiculate cilia.

On earth, near London, Ont. 1889. (*J. Dearness.*)

(501.) **B. oligochloron,** C. M. & Kindb. (n. sp., ad interim); Canadian Musci, No. 554.

This species is still doubtful, being only found in a barren state. It is peculiar in the upper leaf-cells being very narrow (as in the section *Anobryum*), the leaves are ovate-lanceolate, long-acuminate, nearly hyaline and the costa long-excurrent.

On rocks at Deer Park, Lower Arrow Lake, Columbia River, B.C., June 12th, 1890. (*Macoun.*)

(502.) **B. rubicundulum,** C. M. & Kindb. (n. sp.); Canadian Musci. No. 519.

Tufts compact, olive green, very radiculose to the innovations. Stems about 2-3 cm. high. Leaves appressed when dry, concave, obtuse, the lower oblong, the upper ovate, forming small buds, chlorophyllose and not yellow nor hyaline, rarely reddish; borders revolute and narrow-marginate nearly all around; upper cells wide;

costa red, subpercurrent; perichetial leaves narrower, sub-acute and narrow-areolate. Capsule inclined, obovate-oblong, short-necked, constricted below the mouth when dry, purplish-brown; peristome pale-yellow; inner membrane low; cilia short, nodulose or appendiculate; spores small, about 0.016 mm.; lid conical, short-apiculate; pedicel geniculate at the base. Dicœcious.

This species is nearly allied to *B. miniatum* but the stems are more radiculose and very much less foliate, the leaves rarely purplish, and their areolation wider. The capsule of neither species is larger than in *Bryum cæspiticium*, smaller than in *Bryum Atwateriæ*. The leaves in *Bryum percurrentinerve* are larger and bright green.

On the summit of Hermit Mountain close to the glacier on the west side, Roger's Pass, Selkirk Mountains, B.C., August 5th, 1890. (*J. M. Macoun.*)

(503.) **B. anœctangiaceum,** C. M. & Kindb. (n. sp.)

Tufts compact, radiculose, small, scarcely 2 cm. high. Leaves small, rose-colored, loosely disposed, not decurrent, spirally contorted in a dry state, ovate-acute, pellucid, narrow-marginate, entire, faintly revolute, laxly areolate; costa thick, reddish, percurrent or short-excurrent. Probably monœcious, but the male flowers not well developed.

This peculiar species is perhaps nearly allied to *Bryum erythrophyllum* On rocks by the torrent at Hector, Rocky Mountains, B.C., August 12th, 1890. (*Macoun.*)

(504.) **B. capillare,** Linn.; Lesq. & James, Mosses of N. America, 235; Canadian Musci, No. 179.

Pictou Co., N.S. (*McKay.*) On rich earth on rocks, Gilmour's Park, Chelsea, Que.; on roots of trees in woods at Belleville, and in McKay's Woods, Ottawa, Ont.; on rocks, "Dry Cañon," discharge of Devil's Lake, Rocky Mountains; on rocks at Sicamous, Agassiz and Hastings, B.C.; Salt Spring Island, Gulf of Georgia, B.C. (*Macoun.*) Near London, Ont. (*J. Dearness.*) Sitka. (*Roth. Alask.*) Greenland. (*Fl. Gr.*)

* **B. heteroneuron,** C. M. & Kindb. (n. subsp.)

B. Donianum, Bull. Torr. Bot. Club, XVII., 273.
B. obconicum, Bull. Torr. Bot. Club, XVII., 274; Canadian Musci, No. 181.
B. provinciale, Canadian Musci, No. 171.

Differs in the leaves being finally purplish-colored, less contorted when dry, distinctly serrate above, finally red-margined, the costa

dark-purplish, either long-excurrent, with the point thick and very rigid, or vanishing below the apex. Dicœcious.

It agrees also with *Bryum Donianum*, Grev., in the clavate branches and the smaller spores, about 0.01 mm., but the leaf-borders are not incrassate, the capsule is not so large. On earth in McKay's bush, near Ottawa, Ont., (1888); on earth at Hastings, Burrard Inlet, B.C. (1889); on rocks at Esquimalt, Victoria and Nanaimo, Vancouver Island; also on Mount Erskine, Vesuvius Bay, Salt Spring Island, Gulf of Georgia (1887). (*Macoun.*)

Var. **brevicuspidatum,** Kindb. (n. var.) Canadian Musci, No. 180.

Leaves short-pointed.

Bases of stumps near Victoria (1875) and at Cedar Hill (1887), Vancouver Island. (*Macoun.*)

(505.) **B. elegans,** Esenb.

On earth along the Ste. Anne des Monts River, Gaspé Co., Que., August, 1882. (*Macoun.*)

(506.) **B. cyclophyllum,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 237; Canadian Musci, No. 538.

On stones wet with spray, Niagara Falls. (*Clinton.*) On stones at Spray Falls, Banff, Rocky Mountains. (*Macoun.*) Smith's Sound, between lat. 78°—82°. (*Dr. Hayes.*) Godhavn, Greenland. (*Fl. Gr.*)

(507.) **B. obtusifolium,** Lindb.; Fl. Greenland, 370.

Godhavn, and other localities in Greenland. (*Fl. Gr.*)

(508.) **B. erythrophyllum,** Kindb. (n. sp.)

Closely allied to the arctic *Bryum obtusifolium*, Lindb. Barren stems laxly cohering, blood-red, about 1 cm. high. Leaves small, reddish, loosely disposed, flaccid, not decurrent, the lower ovate, subobtuse, the upper leaves sometimes more attenuate, furnished with a rigid point to the excurrent costa, entire, subimmarginate, not reflexed at the margins; areolations lax, nearly uniform; costa red, percurrent or slightly excurrent in a short recurved point.

In boggy places by a brook at Truro, N.S., June 12th, 1883; on wet earth in the Illecillewaet Cañon, near Revelstoke, B.C., May 18th, 1890. (*Macoun.*)

(509.) **B. pallens,** Swartz ; Lesq. & James, Mosses of N. America, 237.

Magdalen Islands. (*McKay.*) On earth and rocks, Gaspé coast, Que. ; along Nepigon River, Ont. ; on earth at Câche Creek, and Quesnel, B.C. ; and in wet places at Victoria, Vancouver Island ; Beaver Creek, Selkirk Mountains, B.C. (*Macoun.*) Jakobshavn, Greenland. (*R. Brown.*)

(510.) **B. Duvalii,** Voit. ; Lesq. & James, Mosses of N. America, 238 ; Canadian Musci, No. 182.

Miquelon Island. (*Delàmare.*) Water courses on the side of Mount Albert, Gaspé Co., Que. (*J. A. Allen.*) Around springs at Truro, N.S. ; wet rocks, in ditches, around Ottawa ; also along the Moira at Belleville ; and in boggy places at Lake Nepigon ; boggy places, shore of Lesser Slave Lake, Athabasca ; at Kicking Horse Lake and Banff, Rocky Mountains ; and around springs, Selkirk Mountains, B.C. (*Macoun.*) Smith's Sound, between lat. 78°—82°. (*Dr. Hayes.*)

Var. **lato-decurrens,** C. M. & Kindb. (n. var.)

Bryum lato-decurrens, Canadian Musci, No. 487.

Differs in the leaves, also in the upper, being looser disposed, longer-decurrent, the uppermost distincter apiculate with a sometimes excurrent costa, the lower shorter and broad, the stem more radiculose.

On wet earth in Roger's Pass, Selkirk Mountains ; in marshes and ditches at Revelstoke, on both sides of the Columbia River, May 5th, 1890. (*Macoun.*)

(511.) **B. pseudotriquetrum,** Schwaegr. ; Lesq. & James, Mosses of N. America, 238 ; Canadian Musci, 183.

Hopewell Bay, and Bay Bull Arm, Newfoundland. (*Rev. A. Waghorne.*) Miquelon Island. (*Delàmare.*) Wet rocks, Bass River, N.B. (*Fowler's Cat.*) On earth at Canaan Forks, Queen's Co., and Tay, York Co., N.B. (*J. Moser.*) Wet ground, Jupiter and Gunn rivers, Anticosti ; damp woods at Campbellton, N.B. ; damp woods near Ottawa ; Sydenham Falls, near Owen Sound, Ont. ; in bogs, at Morley, very abundant at Banff and at Hector, Rocky Mountains ; mountains north of Griffin Lake, Gold Range; also at Quesnel and Yale on the Fraser River, B.C. ; at Comox and Victoria, Vancouver Island. (*Macoun.*) Crevices of wet rocks, Black River, Lake Winnipeg. (*J. M. Macoun.*) Common and variable in Greenland. (*Fl. Gr.*) On wet earth at Cape Vincent, near Kingston, Ont. (*Prof. Fowler.*)

Var. **hyalodontium,** C. M. & Kindb. (n. var.)

Differs principally in the pale-brown capsule and the pale, hyaline, peristome.

On wet rocks at Hector, Rocky Mountains, B.C., August 13th, 1890. (*Macoun.*)

(512.) **B. denticulatum,** Kindb., Bull. Torr. Bot. Club, XVII., 273.

Differs from *B. pseudotriquetrum* in the leaves being distantly denticulate to the middle, lanceolate-acuminate, reflexed at the base. Barren.

Around springs, on the Cypress Hills, Alberta (1880); in a bog in Roger's Pass, Selkirk Mountains, B.C., August 21st, 1885. (*Macoun.*)

(513.) **B. hydrophilum,** Kindb., Bull. Torr. Bot. Club, XVI., 95.

Closely allied to *B. pseudotriquetrum*, but the leaves are narrower, ovate-lanceolate, reflexed at the base or not at all; costa yellow; tufts loose, radiculose only below. Flowers and capsules not found.

Wet springy places near the sea at Nanaimo, Vancouver Island, June 4th, 1887. (*Macoun.*)

(514.) **B. turbinatum,** Schwaegr; Lesq. & James, Mosses of N. America, 238.

On rocks, St. Anne des Monts River, Gaspé Co., Que.; on calcareous rocks at Belleville, Ont.; also along the Athabasca River at Fort Assiniboine, N.W.T.; Blackwater River and Hastings, B.C.; on earth at Comox, Vancouver Island. (*Macoun.*) Galton Mountains, B.C. (*Lyall.*) Greenland. (*Fl. Gr.*)

(515.) **B. meseoides,** Kindb., Bull. Torr. Bot. Club, XVI., 95; Canadian Musci, No. 187.

Dicœcious. Densely cæspitose. Stem 1-2 cm. high, reddish. Leaves yellowish, brown-margined, not decurrent, ovate-oblong or short-lanceolate, short-acuminate, faintly denticulate at the apex, slightly reflexed on the borders at the base, cells rhomboidal-oblong; costa red, scarcely excurrent, abbreviated in the lower leaves; male flowers discoid; perigonial leaves ovate-lanceolate, narrower areolate, denticulate from the middle; perichetial leaves narrow, more acuminate. Capsule narrowly pyriform, defluent to a longer collum, immature, arcuate, pale, wide-mouthed, constricted below the mouth; lid convex, pale-yellow, mammillate; teeth pale-yellow, connivent; annulus double;

cilia perfect, long and appendiculate ; basilar membrane very low or indistinct; pedicel 2-3 cm. long ; spores very small, 0.01 mm.

Differs from *B. turbinatum* in the leaves being narrower, brown-margined and not decurrent ; cells smaller ; perigonial leaves denticulate ; capsule arcuate and long-necked ; spores smaller.

Wet rocks, Gaspé coast, Que. ; along Cave Avenue at Banff, Rocky Mountains ; along the railway in Roger's Pass, Selkirk Mountains ; abundant in wet places at Victoria and Nanaimo, Vancouver Island. (*Macoun.*)

(516.) **B. microcephalum,** C. M. & Kindb. (n. sp. ad interim.)

This is a doubtful species, not having been found with capsules. It somewhat resembles *Bryum cæspiticium*, the stem is proliferous with small male buds, the leaves are contorted, the costa is percurrent or short-excurrent, the inflorescence dicœcious.

On rocks at Deer Park, Lower Arrow Lake, Columbia River, B.C., June 11th, 1890. (*Macoun.*)

(517.) **B. torquescens,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 230.

Wet places at Truro, N.S. ; also on Mount Albert, Gaspé Co., Que. (*Macoun.*) Determination very doubtful ; may be a new variety. (*Kindberg.*)

(518.) **B. Schleicheri,** Schwaegr ; Lesq. & James, Mosses of N. America, 239 ; Canadian Musci, No. 516 ; Drumm. Musc. Bor.-Am., No. 264.

In a marshy spot, near the " Height of Land," Rocky Mountains. (*Drummond.*) In a wet springy place at the base of Avalanche Mountain, Roger's Pass, Selkirk Mountains, B.C. ; on Mount Aylmer, near Devil's Lake, Rocky Mountains, alt. 8,000 feet. (*Macoun.*) Greenland. (*Fl. Gr.*)

(519.) **B. roseum,** Schreb. ; Lesq. & James, Mosses of N. America, 239 ; Drumm. Musc. Bor.-Am., No. 255.

Shady woods, Kent Co., N.B. (*Fowler's Cat.*) About the roots of trees in Upper Canada (Ontario). (*Drummond.*) Very likely the next species.

(520.) **B. Ontariense,** Kindb., Bull. Torr. Bot. Club, XVI., 96; Canadian Musci, No. 184.

Intermediate between *B. roseum* and *B. Beyrichii* (Hsch.) C. Mueller. Comal leaves very numerous, lingulate, abruptly and short acuminate, revolute to $\frac{2}{3}$ or $\frac{3}{4}$, yellow-margined above with great confluent teeth; costa stout, excurrent. Capsule pale, with a distinct, curved collum half as long, teeth papillose and hyaline above; archegonia numerous; lid convex short-apiculate, not oblique.

Hitherto confounded with *Bryum roseum* and quite common throughout Ontario; generally in a barren state. On old logs and sometimes on limestone rocks in maple woods, at Ottawa, Belleville and Owen Sound, Ont. (*Macoun.*) Pine woods, River Rouge, Argenteuil Co., Que. (*D'Urban.*) Common at London, Ont. (*J. Dearness.*) Tay and Canaan Forks, N.B. (*J. Moser.*) Also found in Ohio, United States. (*Prof. Wetherby* fide *Kindberg.*)

(521.) **B. simplex,** Kindb. (n. sp.)

Allied to *Bryum roseum;* differs in the shoots being short, about 2 cm., clavate, the comal leaves smaller, suboval, not cuneate at the base, fainter denticulate, not patent when moist, the cells shorter, nearly uniform, the squamiform leaves indistinct. Barren.

This species is also distinct from *Bryum Ontariense,* Kindb., and *Bryum lucidum,* Britt. We have not seen American specimens of the true *B. roseum.*

In small quantity, in crevices of rocks on the Gold Range, north of Griffin Lake, B.C.; alt. 6,700 feet. August 9th, 1889. (*Macoun.*)

(522.) **B. concinnatum,** Spruce; Lesq. & James, Mosses of N. America, 240.

Greenland. (*Fl. Gr.*)

(523.) **B. acutiusculum,** C. Muell. in Flora, N. 14 (1887).

Alaska. (*Krause.*)

(524.) **B. bullatum,** C. Muell. in Flora N. 14 (1887).

Alaska. (*Krause.*)

(525.) **B. stenotrichum,** C. Muell.

Alaska. (*Krause.*)

78. ZIERIA, Schimp.

(526.) **Z. julacea,** Schimp.; Lesq. & James, Mosses of N. America, 240.

Bryum Zierii, Drumm. Musc. Bor.-Am., No. 252.

Rocks near the "Height of Land," Rocky Mountains. (*Drummond.*) Crevices of damp rocks, Mount Albert, Gaspé Co., Que.; alt. 4,000 feet; on rocks along the Bow River at Morley, Rocky Mountains. (*Macoun.*) Jakobshavn, Greenland. (*R. Brown.*)

(527.) **Z. demissa,** Schimp.; Lesq. & James, Mosses of N. America, 241.

Bryum demissum, Drumm. Musc. Bor.-Am., No. 250.

Summits of the Rocky Mountains; rare. (*Drummond.*) Sabine Island, Greenland. (*Fl. Gr.*)

79. MNIUM, Linn.

(528.) **M. cuspidatum,** Hedw.; Lesq. & James, Mosses of N. America, 242; Canadian Musci, No. 189.

Bryum cuspidatum, Drumm. Musc. Bor.-Am., No. 258.

Shady woods; at the roots of trees. (*Drummond.*) Forms large patches among the roots of trees in woods, N.B. (*Fowler's Cat.*) Canaan Forks and Tay, N.B. (*J. Moser.*) New Harbor and Broad Cove, Newfoundland. (*Rev. A. Waghorne.*) Shaded places, lake region, and at Tobique River, N.B. (*Hay.*) Common in Pictou Co., N.S. (*McKay.*) In woods, Levis Co., Que. (*St. Cyr.*) Miquelon Island. (*Delàmare.*) Very abundant on earth nearly across the continent. Brackley Point, Prince Edward Island; at Truro, N.S.; on Montreal Mountain, Que.; common at Ottawa, Belleville, Owen Sound and other parts of Ontario; Lake Nepigon and Lake Nipissing, Ont.; Swan Lake House, Man.; Revelstoke, Eagle Pass, Quesnel and Agassiz, B.C. (*Macoun.*) Athabasca River, N.W.T. (*J. M. Macoun.*) Vicinity of Kingston, Ont. (*Prof. Fowler.*) Saskatchewan River. (*Bourgeau.*) A common species at London, Ont. (*J. Dearness.*)

Var. **tenellum,** Kindb. (n. var.)

Differs in all parts being smaller.

On earth in woods at Rustico Bay, Prince Edward Island, July 3rd, 1888. (*Macoun.*)

(529.) **M. venustum,** Mitt.; Lesq. & James, Mosses of N. America, 242 ; Canadian Musci, No. 190.

M. Nevii, C. Muell. ; Lesq. & James, Mosses of N. America, 242.

Vancouver Island. (*Lyall.*) Crevices of rocks at the mouth of Pass Creek, Columbia River ; also on logs at Hastings, B.C. ; very common on rocks, Blackwater River, B.C. ; crevices of rocks, around Victoria, Cedar Hill and Goldstream, Vancouver Island. (*Macoun.*)

(530.) **M. macrociliare,** C. M. & Kindb. (n. sp.)

Bisexual. Loosely tufted. Stem densely foliate, sometimes stoloniferous. Leaves green or bright green, subdistichous not decurrent, pale-margined, simply or doubly dentate-ciliate, subobovate ; the perichetial smaller and narrower ; costa always excurrent. Capsule single (or 2-clustered), oblong, inclined or pendent ; lid pale, conic, red-margined, short-rostrate ; teeth yellow ; pedicel purplish below, yellow above.

This fine species is allied to *Mnium venustum* Mitt. (*Mnium Nevii,* C. M.), but differing principally in the less densely foliate not clavate stems.

On rocks by a mountain brook along the Columbia River, above Revelstoke, B.C., May 14th, 1890 ; on earth in damp woods near Wooler, Northumberland Co., Ont. (*Macoun.*)

(531.) **M. Drummondii,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 243 ; Canadian Musci, No. 191.

Pictou Co., N.S. (*McKay.*) In large patches on the ground in shady places, New Brunswick. (*Fowler's Cat.*) Tay, York Co., N.B. (*J. Moser.*) Along River Rouge, Argenteuil Co., Que. (*D'Urban.*) In damp woods around Ottawa ; also at Belleville, and North Bay Lake Nipissing, Ont. ; in cool woods, Swan Lake House, Swan Lake, Man. ; in woods at Morley, Rocky Mountains , abundant at Revelstoke on the Columbia, also at Quesnel on the Fraser, and at McLeod's Lake, B.C. (*Macoun.*)

(532.) **M. rostratum,** Schwaegr ; Lesq. & James, Mosses of N. America, 243 ; Canadian Musci, No. 192.

On stones in Beaver Creek, Hastings Road Crossing, Hastings Co., Ont. ; damp limestone rocks at Owen Sound, Ont. ; in the spray of Kakabeka Falls, west of Port Arthur, Lake Superior ; near McLeod's Lake, lat. 55° ; on stones along a brook one mile north of Revelstoke, B.C. (*Macoun.*) On rocks, North Thompson River, B.C. (*J. M.*

Macoun) Smith's Sound, between lat. 78°—82°. (*Dr. Hayes.*) New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

(533.) **M. medium,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 243.

Pend d'Oreille and Pack rivers, and Cascade Mountains, B.C. (*Lyall.*) Damp shaded ravines, Bass River, N.B. (*Fowler's Cat.*)

(534.) **M. affine,** Bland. ; Lesq. & James, Mosses of N. America, 244 ; Canadian Musci, No. 193.

Bryum affine, Drumm. Musc. Bor.-Am., No. 256.

Miquelon Island. (*Delàmare.*) Harbor Breton, Forteau Bay, Newfoundland. (*Rev. A. Waghorne.*) Pictou Co., N.S. (*McKay.*) Damp shaded bank of a brook at Bass River, also at Fredericton, N.B. (*Fowler's Cat.*) Tay, York Co., N.B. (*J. Moser.*) Mansfield Island, Hudson Strait. (*R. Bell.*) On earth in a brook at Whycocogmah, Cape Breton ; by a brook, Gaspé Co., Que. ; quite common in swamps and springs throughout Ontario, at Ottawa, Belleville and Owen Sound ; in swamps at Swan Lake House, Swan Lake, Man. ; in a bog in Eagle Pass, west of Revelstoke, and at Sicamous and McLeod's Lake, B.C. (*Macoun.*) Wet place at Observation Point, Lake Winnipeg. (*J. M. Macoun.*) On earth along the River Rouge, Argenteuil Co., Que. (*D'Urban.*) Shady moist places. (*Drummond.*) Gananoque, near Kingston, Ont. (*Prof. Fowler.*) Common at London, Ont. (*J. Dearness.*) Sitka. (*Roth. Alask.*) Greenland. (*Rosenvinge.*)

(535.) **M. rugicum,** Laur.

Differs from *M. affine* principally in the nearly entire leaves, the upper not larger nor crowded.

Quite common in Dow's swamp, near Ottawa, Ont. (*Macoun.*) Smith's Sound, between lat. 78°—82°. (*Dr. Hayes.*)

(536.) **M. insigne,** Mitt. ; Lesq. & James, Mosses of N. America, 244 ; Canadian Musci, No. 194.

Vancouver Island. (*Wood, Lyall.*) British Columbia. (*Lyall.*) On earth, in woods at Belleville, Ont. ; in a bog, Eagle Pass, Gold Range, B.C. ; also on earth at Blackwater River, and on logs at Hastings, B.C. ; very abundant at Cedar Hill and Comox, Vancouver Island. (*Macoun.*) Wet places, Melaspina Inlet, B.C. (*Dawson.*)

Var. **intermedium,** Kindb. (n. var.)

*Mnium medium, * robustum,* Kindb. Torr. Bot. Club, XVII., 274.

Agrees with *Mnium insigne* in the leaves being long-decurrent, long-dentate, cells hexagonal-rotundate, &c.; differs in the inflorescence. Synœcious.

The true *Mnium medium* (from the alps of Norway) has a very short stem, about 1 cm. long, the leaves crowded, short-dentate, and not decurrent.

On earth at Hunter's River, Prince Edward Island; wet rocks, New Westminster, B.C.; abundant in damp woods near Cedar Hill Church, Victoria, Vancouver Island, April 17th, 1887. (*Macoun.*)

(537.) **M. hornum,** Linn.; Lesq. & James, Mosses of N. America, 245; Canadian Musci, No. 195.

Nova Scotia. (*N. B. James.*) In dense patches in shady woods at Truro, N.S. (*Fowler's Cat.*) Pictou Co., N.S., and Magdalen Islands. (*McKay.*) Miquelon Island. (*Delàmare.*) Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On earth near the sea at Yarmouth, and on rocks North-West Arm, Halifax, N.S.; on rocks, Gunn River, Anticosti; damp earth, Hunter's River, Prince Edward Island; on earth in damp woods at Belleville, Wooler and Port Dover, Ont. (*Macoun.*) Freshwater and New Harbor, near St. John, Green Harbor, Tickle Harbor, Chance Cove, Grand Vache, Western Cove and Blaketown, Newfoundland. (*Rev. A. Waghorne.*)

(538.) **M. serratum,** Brid.; Lesq. & James, Mosses of N. America, 245; Canadian Musci, No. 196.

Damp or wet rocks along streams, not uncommon. Jupiter River, Anticosti; along the Ste. Anne des Monts River, Gaspé Co., Que.; on earth, along the Sydenham River at Owen Sound; on rocks in woods, Lake Nipissing, Ont.; on earth by the torrent at Hector, Rocky Mountains; wet rocks along the Columbia River at Revelstoke, on earth at Sicamous, Lytton, Yale and Hastings, Burrard Inlet, B.C.; on earth at Victoria, Vancouver Island. (*Macoun.*)

Var. **Macounii,** Kindb. (n. var.)

Inflorescence parœcious. Leaves red-margined; costa excurrent. Lid obliquely rostellate.

In dry woods, Rustico Bay, Prince Edward Island, July 16th, 1888. (*Macoun.*)

(539.) **M. orthorrhynchum,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 246; Canadian Musci, No. 479, in part.

Grand Falls of the Nipisiquit, N.B. (*Fowler's Cat.*) Canaan Forks and Tay, N.B. (*J. Moser.*) Pirate's Cove, Straits of Canso, N.S.; Ste. Anne des Monts River, Gaspé Co., Que. ; on rocks in McKay's woods at Ottawa ; in mud upon rocks at Owen Sound, Ont. ; dry rocks at Lake Nepigon ; crevices of rocks, three miles below Hector, Rocky Mountains ; on rocks in Roger's Pass, Selkirk Mountains ; on rocks, Câche Creek, and Agassiz, B.C. (*Macoun.*) Crevices of rocks, Mount Queest, Gold Range, B.C. (*J. M. Macoun.*) Greenland. (*Fl. Gr.*)

(540.) **M. decurrens,** C. M. & Kindb. (n. sp.) ; Canadian Musci, No. 517.

Dicœcious. Loosely tufted. Stem very loosely foliate, naked below, elongate. Leaves green or finally reddish, subdistichous, long-decurrent, often red at the margins and the wings, doubly dentate, lanceolate, the inner perichetial ones sublinear, red-cuspidate ; cells smaller than in *Mnium umbratile ;* costa sub-percurrent, often red, in the inner perichetial leaves excurrent. Capsule single, oval, inclined ; lid pale, conic, not margined, short-apiculate, not rostrate, teeth dark yellow ; pedicel reddish.

This species resembles *Mnium orthorrhynchum* in the size of the capsule ; the leaf cells are not much larger ; from *Mnium umbratile* it is well distinct, also in the narrower leaves less twisted when dry.

On stones in a mountain brook entering the Columbia about a mile above Revelstoke, on the east side, May 4th, 1890 ; also at Pass Creek Falls, near Sproat, Columbia River, B.C. (*Macoun.*)

(541.) **M. pseudo-lycopodioides,** C. M. & Kindb.

M. lycopodioides, Lesq. & James, Mosses of N. America, 246 ; Canadian Musci, No. 197.
M. orthorrhynchum, Canadian Musci, No. 471, in part.

This species is already described by Lesq. & James, but is a new species quite distinct and not corresponding to the true *M. lycopodioides,* Schw. (fide *C. Muell.*) From the closely allied *M. orthorrhynchum* it is separated by the excurrent costa of the upper leaves and the narrower capsule. Fortune Bay and Placentia Bay, Newfoundland. (*Rev. A. Waghorne.* In a damp shaded ravine, Bass River ; also at Fredericton, N.B. (*Fowler's Cat.*) Rocky banks, Tobique River, N.B. (*Hay.*) Near the mouth of Martin River, Gaspé Co., Que. (*J. A. Allen.*) Banks of the River Rouge, Argenteuil Co., Que. (*D'Urban.*) Rocky

woods, Pirate's Cove, Straits of Canso, N.S.; on the bases of trees at Ottawa and Belleville; also in Kiladar, Addington Co., and on bases of trees shore of Lake Nepigon, Ont.; on earth, Porcupine Mountains, Man.; on earth, at Kananaskis, and Morley, Rocky Mountains; on the bases of trees in woods at Revelstoke, B.C. (*Macoun.*) In woods at London, Ont. (*J. Dearness.*)

(542.) **M. inclinatum,** Lindb.; Canadian Musci, No. 551.

Bryum marginatum, Drumm. Musc. Bor.-Am., No. 259.

On rocks and upon trunks of trees. (*Drummond.*) On old stumps in Dow's swamp, and on rocks in McKay's woods, Ottawa; crevices of rocks at Owen Sound, Ont.; on earth at Hector, and rocks at Banff, Rocky Mountains; on rocks on the west side of the Columbia River at Revelstoke, B.C. (*Macoun.*)

(543.) **M. umbratile,** Mitt.; Lesq. & James, Mosses of N. America, 246; Canadian Musci, No. 520.

Mountain rocks, second point of wood, Portage River, Rocky Mountains. (*Drummond.*) Galton Mountains, British Columbia. (*Lyall.*) On earth and stones along a mountain brook entering the Columbia River, one mile above Revelstoke, BC.; also at Quesnel, B.C. (*Macoun.*)

(544.) **M. spinulosum,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 247; Canadian Musci, No. 198.

Bryum spinosum, Drumm. Musc. Bor.-Am., No. 257.

In woods near Smoky River. (*Drummond.*) Damp shaded places, Bass River, N.B. (*Fowler's Cat.*) Canaan Forks and Tay, N.B. (*J. Moser.*) Pine woods, Pirate's Cove, Straits of Canso, N.S.; roots of trees, Ste. Anne des Monts River, Gaspé Co., Que.; bases of trees in woods at Ottawa, Carleton Place, Belleville, Flinton, North Bay Lake Nipissing, Port Dover, Leamington, Owen Sound and Wooler, Ont.; woods, Lake Nepigon, Ont.; and roots of trees, Lake Winnipegoosis, Man.; bases of trees at Revelstoke, Quesnel, McLeod's Lake, Sicamous and Hastings, B.C.; Mount Erskine, Salt Spring Island, Gulf of Georgia. (*Macoun.*) On earth, Melaspina Inlet, B.C. (*Dawson.*) In woods at Loughboro', near Kingston, Ont. (*Prof. Fowler.*)

(545.) **M. Niagaræ,** Kindb. (n. sp.); Canadian Musci, No. 581.

Intermediate between *M. spinulosum* and *M. serratum,* but readily distinguished from both by the wide-mouthed capsule.

Loosely tufted without creeping stolons; fertile stem simple. Leaves

dark-green, crisped when dry; indistinctly decurrent, doubly dentate at the red-margined borders; the lower more loosely disposed, oblong, the upper lanceolate; cells rotundate-hexagonal, often pellucid; costa red-brown, excurrent, at least in the upper leaves. Perichetial leaves narrow sub-linear, dentate, the innermost very short. Capsule solitary, pendent, narrow, often appressed to the pedicel, subclavate-cylindric, constricted below the wide mouth; teeth yellow; lid obliquely rostrate; pedicel pale-red. This species, synœcious, intermediate between *Mnium spinulosum* and *M. serratum*, is readily distinct in the wide-mouthed capsule.

On earth under trees near the water in the woods bordering the Whirlpool, Niagara Falls, Ont., June 6th, 1891. (*Macoun.*)

(546.) **M. stellare,** (Reichardt) Hedw.; Lesq. & James, Mosses of N. America, 247; Canadian Musci, No. 199.

M. orthorrhynchum, Canadian Musci, No. 471, in part.

Margins of brooks, Carleton, N.B. (*Fowler's Cat.*) Swamps, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Roots of trees, Madeline River, Gaspé Co., Que.; Dow's swamp, near Ottawa; cedar swamps at Belleville and Owen Sound, Ont.; crevices of rocks at Hector, Rocky Mountains. (*Macoun.*) In woods, London, Ont. (*J. Dearness.*)

(547.) **M. Blyttii,** Bruch & Schimp.

Bases of stumps at Morley, Rocky Mountains; on earth among rocks Gold Range, north of Griffin Lake, B.C.; alt. 6,500 feet. (*Macoun.*)

(548.) **M. cinclidioides,** Hueben; Lesq. & James, Mosses of N. America, 248.

On earth in wet woods, Brackley Point, Prince Edward Island; wet swampy woods, Huntingdon, North Hastings, Ont.; in wet boggy woods at Nanaimo, Vancouver Island. (*Macoun*) Frederikshaab, Greenland. (*Rosenvinge.*)

(549.) **M. punctatum,** Hedw.; Lesq. & James, Mosses of N. America, 248; Canadian Musci, No. 200.

Bryum punctatum, Drumm. Musc. Bor.-Am., Nos. 253, 254 and 272, in part.

Moist woods and marshes, York Factory, Lake Huron and Rocky Mountains. (*Drummond.*) Damp shady ravine, Bass River and at Fredericton, N.B. (*Fowler's Cat.*) Swamps, Tobique River, N.B. (*Hay.*) Canaan Forks, Queen's Co., and Tay, York Co., N.B. (*J. Moser.*) Pictou, N.S. (*McKay.*) Miquelon Island. (*Delàmare.*)

New Harbor, Topsail and Blaketown, Newfoundland ; Battle Harbor, Labrador. (*Rev. A. Waghorne.*) In swamps, Levis Co., Que. (*St. Cyr.*) Cold swamps, River Rouge, Argenteuil Co., Que. (*D'Urban.*) Swamps and wet woods across the continent. Jupiter River, Anticosti ; Pirate's Cove, Straits of Canso, N.S. ; Campbellton, N.B. ; coast of Gaspé Co., Que. ; swamps at Ottawa, Belleville, Port Dover and Owen Sound, Ont. ; shore of Lake Superior and Kakabeka Falls west of that lake ; at Banff, Stephen and Hector, Rocky Mountains ; at Revelstoke, Sicamous and Yale, B.C. ; common at Comox and Victoria, Vancouver Island. (*Macoun.*) In swamps, London, Ont. (*J. Dearness.*) On Mount Queest, Gold Range, B.C. alt., 7,000 feet ; Kodiak Island and Sitka, Alaska, and Ounalaska, Behring Sea, 1891. (*J. M. Macoun.*) Swamps, Queen Charlotte Islands. (*Dawson.*) Sitka. (*Roth. Alask.*) Greenland. (*Fl. Gr.*)

(550.) **M. subglobosum,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 248 ; Canadian Musci, No. 201.

Cinclidium stygium, Drumm. Musc. Bor.-Am., No. 272, in part.

Swamps, Red Rock, Lake Superior ; swamps at Lake Athabasca ; along the "Telegraph Trail" north of Blackwater River, B.C. ; peat swamps at Banff and Stephen, Rocky Mountains ; on earth, Bear Creek, Roger's Pass, Selkirk Mountains. (*Macoun.*) Marshes near the Rocky Mountains. (*Drummond.*) Sabine Island and Ivigtut, Greenland. (*Fl. Gr.*)

(551.) **M. hymenophyllum,** Byrol. Europ. IV. t. 400.

Upernivik and other localities in Greenland. (*Fl. Gr.*)

(552.) **M. hymenophylloides,** Hueben ; Lesq. & James, Mosses of N. America, 249.

Battle Harbor, Labrador. (*Rev. A. Waghorne.*) On damp rocks, Pirate's Cove, Straits of Canso, N.S. ; under flat rocks, on earth, at Hector and three miles below, Rocky Mountains. (*Macoun.*) Greenland. (*Fl. Gr.*)

(553.) **M. Menziesii,** C. Muell. ; Lesq. & James, Mosses of N. America, 249 ; Canadian Musci, No. 202.

In woods at Hot Springs, Kootanie Lake, and in abundance on logs at Hastings, B.C. ; quite common at Cedar Hill and Victoria, Vancouver Island. (*Macoun.*) On earth in woods, Melaspina Inlet, B.C. (*Dawson.*) Sitka. (*Roth. Alask.*)

80. CINCLIDIUM, Swartz.

(554.) **C. stygium,** Swartz ; Lesq. & James, Mosses of N. America, 250 ; Drumm. Musc. Bor.-Am., No. 272, in part.

C. subrotundum, Canadian Musci, No. 206.

. Wet ground, Forteau, Labrador. (*J. A. Allen.*) Swamps, Salt Lake, and Becscie River, Anticosti ; in swamps at Truro, N.S. ; swamps at Banff and at Kicking Horse Lake, Rocky Mountains. (*Macoun.*) Swamps in the Rocky Mountains. (*Drummond.*)

(555.) **C. subrotundum,** Lindb. ; Lesq. & James, Mosses of N. America, 250.

Greenland. (*Vahl.*) Labrador. (*Breutel.*) [Broad Cove, Newfoundland. (*Rev. A. Waghorne.*)] ?

SUB-TRIBE I. AULACOMNIEÆ.

81. AULACOMNIUM, Schwaegr.

(556.) **A. androgynum,** Schwaegr ; Lesq. & James, Mosses of N. America, 252 ; Canadian Musci, No. 207.

On earth at the bases of trees in woods, Pirate's Cove, Straits of Canso, N.S. ; on old logs at Hastings, Burrard Inlet, B.C. ; very common on old logs, stumps and rocks at Victoria, Nanaimo, and Comox, Vancouver Island. (*Macoun.*) On rocks, Melaspina Inlet, B.C. (*Dawson.*) Vancouver Island. (*Lyall.*)

(557.) **A. palustre,** Schwaegr ; Lesq. & James, Mosses of N. America, 252 ; Canadian Musci, No. 208.

Bryum palustre, Drumm. Musc. Bor.-Am.. No. 242.

Marshy places ; frequent. (*Drummond.*) Common about New Harbor, Newfoundland ; Battle Harbor, Cape Charles and Fox Harbor, Labrador. (*Rev. A. Waghorne.*) Swamps, Bass River, N.B. (*Fowler's Cat.*) Abundant at Canaan Forks, Queen's Co., and Tay, York Co., N.B. (*J. Moser.*) Nottingham Island, Hudson Strait. (*R. Bell.*) Pictou Co., N.S. (*McKay.*) Vicinity of Quebec. (*St. Cyr.*) Miquelon Island. (*Delàmare.*) In bogs at Louisburg, Cape Breton ; also at Truro, N.S. ; in bogs, Tignish, Prince Edward Island ; boggy ground, Gaspé Co., Que. ; in swampy woods throughout Ontario and westward to the Pacific, fruiting abundantly at Banff in the

Rocky Mountains, at Revelstoke, B.C. and on Vancouver Island. (*Macoun.*) Along the Athabasca River. (*J. M. Macoun.*) Dorchester, near London, Ont.; common. (*J. Dearness.*) Saskatchewan and Rocky Mountains. (*Bourgeau.*) Cascade Mountains. (*Lyall.*) Kotzebue Sound, Sitka and Nulato. (*Roth. Alask.*) Jakobshavn and Godthaab, Greenland. (*R. Brown.*)

Var. **imbricatum,** Bruch & Schimp.; Canadian Musci, No. 209.

New Harbor, Newfoundland. (*Rev. A. Waghorne.*) In swamps at Belleville, Ont.; on rocks at North Arm of Burrard Inlet, B.C.; common on rocks at Nanaimo, Vancouver Island. (*Macoun.*) Boggy ground, east side of Lake Winnipeg. (*J. M. Macoun.*) Mountains east of Adams Lake, B.C.; alt. 5,600 feet. (*Dawson.*)

Var. **polycephalum,** Bruch & Schimp.; Canadian Musci, No. 210.

In boggy woods at Brackley Point, Prince Edward Island; common in wet woods at Belleville, Ont.; also North Bay, Lake Nipissing and Lake Nepigon, Ont.; marshy spots at Morley, Rocky Mountains; also at Goldstream, Vancouver Island. (*Macoun.*) Abundant at New Harbor, Newfoundland; Deep Water Creek and Fox Harbor, Labrador. (*Rev. A. Waghorne.*)

Var. **laxifolium,** Kindb. (n. var.)

Leaves laxly disposed.

On earth in boggy soil, Roger's Pass, at the "Summit," Selkirk Mountains, B.C., August 6th, 1890. (*Macoun.*)

(558.) **A. turgidum,** Schwaegr; Lesq. & James, Mosses of N. America, 253.

Bryum turgidum, Drumm. Musc. Bor.-Am., No. 243.

Moist mountainous situations; rare in fructification. (*Drummond.*) Seal Islands and Battle Habor, Labrador. (*Rev. A. Waghorne.*) Whale Island, Chateau Bay, Labrador. (*J. A. Allen.*) Upper Savage Islands, Hudson Strait. (*R. Bell.*) On both sides of Baffin's Bay. (*Ross' Voyage.*) Smith's Sound and West Greenland. (*Dr. Kane.*) Women's Islands, Baffin's Bay. (*R. Brown.*) Smith's Sound between lat. 78°—83°. (*Dr. Hayes.*) Kotzebue Sound. (*Roth. Alask.*) St. Paul Island, Behring Sea, 1891. (*J. M. Macoun.*) Common in Greenland. (*Fl. Gr.*)

LIBRARY OF THE UNIVERSITY OF CALIFORNIA

(559.) **A. heterostichum,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, No. 211.

Arrhenopterum heterostichum, Drumm. Musc. Bor.-Am., No. 274.

Upper Canada (Ontario). (*Drummond.*) Abundant at the bases of trees in damp woods four miles beyond Ferry Point opposite Belleville, Ont.; also in woods, Seymour, Northumberland Co., Ont.; abundant in damp woods at Leamington, Ont. (*Macoun.*) Near London, Ont. (*J. Dearness.*)

SUB-TRIBE II. TIMMIEÆ.

82. TIMMIA, Hedw.

(560.) **T. megapolitana,** Hedw.; Lesq. & James, Mosses of N. America, 254; Canadian Musci, No. 212; Drumm. Musc. Bor.-Am., 273.

Moist shady rocks; common. (*Drummond.*) At the bases of trees in swamps, Ste. Anne des Monts River, Gaspé Co., Que.; Dow's swamp, Ottawa; abundant at Belleville and Owen Sound, also at Leamington, Ont.; crevices of rocks at Morley and Devil's Lake, Rocky Mountains; also along Lesser Slave Lake, Athabasca; vicinity of Victoria, Vancouver Island. (*Macoun.*) Athabasca River at the forks of the Clearwater. (*J. M. Macoun.*) London, Ont. (*J. Dearness.*) Vancouver Island and Galton Mountains, B.C. (*Lyall.*) Saskatchewan River. (*Bourgeau.*) Greenland. (*Fl. Gr.*) Conception Bay, Newfoundland. (*Rev. A. Waghorne.*)

(561.) **T. Austriaca,** Hedw.; Lesq. & James, Mosses of N. America, 255; Canadian Musci, No. 213.

Cascade Mountains and Pack River, B.C. (*Lyall.*) Damp rocks, Hudson Hope, Peace River, lat. 56°; on rocks at Hector, Rocky Mountains; common along the Columbia River above Revelstoke, also at Sicamous, Câche Creek and Yale, B.C.; common on wet rocks at Nanaimo and Goldstream, Vancouver Island. (*Macoun.*) Alert Bay, Vancouver Island. (*Dawson.*) Greenland. (*Fl. Gr.*)

(562.) **T. Norvegica,** Zett. Bull. Bot. Soc. Fr., 1862; Canadian Musci, No. 586.

Bank of the torrent at Hector, and in mud at the second creek east of that point, August 17th, 1890, and in the "Dry Cañon," discharge of Devil's Lake, Rocky Mountains, 1891. (*Macoun.*) Greenland. (*Fl. Gr.*)

FAMILY XVII. POLYTRICHEÆ.

83. ATRICHUM, Beauv.

(563.) **A. undulatum,** Beauv.; Lesq. & James, Mosses of N. America, 256; Canadian Musci, No. 214.

On banks, at the "Height of Land," Rocky Mountains; but rare. (*Drummond.*) New Harbor, Bay Bull Arm, Chance Cove and Broad Cove, Newfoundland. (*Rev. A. Waghorne.*) Miquelon Island. (*Delàmare.*) Pictou Co., N.S. (*McKay.*) At Canaan Forks, Queen's Co., and Tay, York Co., N.B. (*J. Moser.*) On the ground in Kent Co., N.B. (*Fowler's Cat.*) On earth at Rustico Bay, Prince Edward Island; common on banks in woods at Ottawa, Lake Nipissing, Belleville and Owen Sound, Ont.; wet earth and turned-up stumps at Hastings and Yale, B.C.; common at Comox and Victoria, Vancouver Island. (*Macoun.*) Very common on knolls near London, Ont. (*J. Dearness.*)

(564.) **A. angustatum,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 256; Canadian Musci, No. 215.

Polytrichum angustatum, Drumm. Musc. Bor.-Am., No. 285.

New Harbor, Broad Cove and Bay Bull Arm, Newfoundland. (*Rev A. Waghorne.*) On the ground at Bass River, N.B. (*Fowler's Cat.*) Canaan Forks, Queen's Co., N.B. (*J. Moser.*) In dry sandy woods at Belleville, Ont.; also in Seymour West, Northumberland Co., Ont.; in woods at Leamington, Ont.; in woods, McLeod's Lake, lat. 55°, B.C. (*Macoun.*) Banks, &c., in Canada. (*Drummond.*) Vicinity of London, Ont. (*J. Dearness.*)

(565.) **A. Selwyni,** Aust.; Lesq. & James, Mosses of N. America, 256; Canadian Musci, No. 216.

Crevices of rocks, House Mountain, near Lesser Slave Lake, September 18th, 1872; on damp earth in Roger's Pass, and along Beaver Creek, Selkirk Mountains; along the Columbia River at Revelstoke, B.C. (*Macoun.*)

(566.) **A. Lescurii,** James; Lesq. & James, Mosses of N. America, 257.

Alaska. (*Kellogg.*) Sitka Island, Alaska. 1891. (*J. M. Macoun.*) This species occurs also in Japan, but in the specimens collected there by Mr. Bisset (in herb. *Kindberg*) the stem is at least a third shorter.

(567.) **A. crispum,** James ; Lesq. & James, Mosses of N. America, 257 ; Canadian Musci, No. 540.

A. xanthopelma, Canadian Musci, No. 463.

On earth in woods near Wooler, Northumberland Co., Ont. ; also in woods at Port Dover and Leamington, Ont. ; on earth along the Columbia River, about a mile above Revelstoke, B.C. ; abundant on a loamy bank at Craigellachie, Eagle Pass, B.C. (*Macoun.*)

(568.) **A. parallelum,** Mitt. ; Lesq. & James, Mosses of N. America, 258 ; Canadian Musci, No. 426.

Polytrichum undulatum, Drumm. Musc. Bor.-Am., No. 286.

Grand Côte, Rocky Mountains. (*Drummond.*) Wet rocks in Roger's Pass and on the higher slopes of Mount Cheops, Selkirk Mountains ; also on the Gold Range north of Griffin Lake, B.C. ; alt. 6,500 feet. (*Macoun.*)

(569.) **A. leiophyllum,** Kindb., Bull. Torr. Bot. Club XVII, 275 ; Canadian Musci, No. 217.

Plants erect, simple, naked below, densely foliate above, about 5–7 cm. high. Leaves smooth, lower very small, upper lanceolate and acute-cuspidate, not margined, the base scarcely broader ; borders sharply serrate with large teeth, the basal only, entire ; basilar cells narrow, the other round-hexagonal, all pellucid ; costa percurrent ; lamellæ 6, disappearing below the apex, entire or slightly crenulate. Capsule single, 0.5–0.6 cm. long, sub-cylindrical, thicker below, 0.2 cm. broad, slightly curved, constricted at the mouth ; lid obliquely rostrate from the conic base ; perichetial leaves long-cuspidate with an excurrent costa ; pedicel bright red, 4-5 cm. long. Dicœcious.

This fine species differs considerably from *A. parallelum* in the smooth leaves, &c.

In damp woods on the lower slopes of Mount Arrowsmith, Vancouver Island, July 18th, 1887 ; on earth in Roger's Pass, Selkirk Mountains, B.C., August, 1890. (*Macoun.*)

(570.) **A. rosulatum,** C. M. & Kindb. (n. sp.)

Dicœcious. Stem indistinct or very short. Leaves rosulate, undulate, not margined, dentate at the middle, sometimes beset with transverse rows of small scales, the lower sub-oblong, the upper short-lanceolate, subobtuse ; costa scarcely percurrent, nearly smooth. Barren.

This species is not to be confounded with our other species, though

the scales of the leaves are not always to be found. All other species, except *A. leiophyllum* and *A. parallelum*, have margined leaves.

On the bank of the Columbia River, between the railway bridge and the whirlpool, west side of River at Revelstoke, B.C., May 6th, 1890. (*Macoun.*)

84. OLICOTRICHUM, DC.

(571.) **O. aligerum,** Mitt.; Lesq. & James, Mosses of N. America, 258; Canadian Musci, No. 218.

Grand Côte, Rocky Mountains. (*Drummond.*) On clay banks by roadsides at Hastings, B.C.; also on wet clay banks, west of Glacier Hotel, Selkirk Mountains, B.C. (*Macoun.*)

(572.) **O. Lyallii,** Lindb.; Lesq. & James, Mosses of N. America, 259.

In swampy places on the east side of the Cascade Mountains, British Columbia, at an elevation of 7,000 feet, July, 1860. (*Lyall.*)

(573.) **O. hercynicum,** (Ehrh.) DC., Fl. Fr. I. 492.

Not uncommon in Greenland. (*Fl. Gr.*) St. Lawrence Island, Behring Sea, 1891. (*J. M. Macoun.*)

Var. **latifolium,** C. M. & Kindb. (n. var.)

Differs in the shorter and entire leaves; the capsule is distinctly plicate.

By a glacier stream descending from Hermit Mountain in Roger's Pass, Selkirk Mountains, July 31st, 1890. (*Macoun.*)

85. PSILOPILUM, Brid.

(574.) **P. arcticum,** Brid.; Lesq. & James, Mosses of N. America, 260.

Peat bogs; Labrador, Greenland and Arctic America. (*Lesq. & James.*) Jakobshavn, Greenland. (*R. Brown.*) St. Paul Island, Behring Sea, 1891. (*J. M. Macoun.*)

86. POGONATUM, Beauv.

(575.) **P. brevicaule,** Beauv.; Lesq. & James, Mosses of N. America, 260.

P. capillare, Canadian Musci, No. 377.

Pictou Co., N.S. (*McKay.*) On clayey soil, Bass River and Carleton, N.B. (*Fowler's Cat.*) On clay by the roadside, beyond the marsh,

near Shaw's, Brackley Point, Prince Edward Island; also at Casselman, near Ottawa, Ont. (*Macoun.*)

(576.) **P. capillare,** Brid.; Lesq. & James, Mosses of N. America, 261.

Not uncommon in Greenland. (*Fl. Gr.*) Miquelon Island. (*Delàmare.*) Chance Cove, Newfoundland. (*Rev. A. Waghorne.*)

(577.) **P. dentatum,** Brid.; Lesq. & James, Mosses of N. America, 261; Canadian Musci, No. 544.

P. urnigerum, Canadian Musci, No. 219, in part.
Polytrichum urnigerum, Drumm. Musc. Bor.-Am., No. 284.

Banks amongst the Rocky Mountains. (*Drummond.*) North-west coast. (*Nelson, Menzies.*) Alaska. (*Bischoff.*) On the summit of Mount Queest, Gold Range, B.C., alt. 7,000 feet; St. Paul Island, Behring Sea, 1891. (*J. M. Macoun.*) Very abundant by the side of the railway in Roger's Pass and by Beaver Creek, Selkirk Mountains. (*Macoun.*) *Polytrichum capillare,* Michx., is probably a form of *P. dentatum,* Menzies, with the stem low and nearly simple.

(578.) **P. contortum,** Lesq.; Lesq. & James, Mosses of N. America, 262.

Alaska. (*Kellogg.*) North-west coast. (*Menzies.*) On the roots of upturned Douglas Fir in woods along the Columbia River, above Revelstoke, B. C. (*Macoun.*)

(579.) **P. erythrodontium,** Kindb. (n. sp.)

P. contortum, Canadian Musci, No. 430.

Stem erect, simple, or furnished with a short innovation above, naked below, 10–12 cm. long. Leaves green, spreading, flexuous and not incurved when dry, plane and patent when moist, linear-lanceolate, acuminate, red-denticulate all around, not sheathing, undulate, hispid or margined; cells round-hexagonal, chlorophyllose, also the marginal; lamellæ distinct and not confluent, numerous, 20–30; costa narrow, percurrent. Capsule single, short, ovate-cylindrical, erect and papillose, wide-mouthed; teeth red-brown, narrowly hyaline-margined all around, narrowly lingulate; pedicel about 4 cm. long. Dicœcious.

This species is allied to *P. contortum* and *P. atrovirens,* but very dis-

tinct. Dr. C. Mueller considers these (three) as belonging to a peculiar subgenus (section) *Catharinella*.

By a roadside in wet woods near Comox, Vancouver Island, May 3rd, 1887. (*Macoun*). Prince of Wales Island, Alaska. 1891. (*J. M. Macoun.*) Stanley Park, Vancouver City, B.C. (*Law.*)

(580.) **P. atrovirens,** Mitt.; Lesq. & James, Mosses of N. America, 262.

Sitka. (*Barclay.*) Abundant by roadsides at Hastings, Burrard Inlet, B.C., April 6th, 1889. (*Macoun.*)

(581.) **P. urnigerum,** Beauv.; Lesq. & James, Mosses of N. America, 262; Canadian Musci, No. 219, in part.

On earth, New Harbor, Broad Cove, Chance Cove and Harbor Breton, Newfoundland. (*Rev. A. Waghorne.*) Dry turf on a ledge, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) In woods at Truro, N.S.; very abundant by roadsides at Cape Rosier and other points, Gaspé Co., Que.; along Bear Creek, Roger's Pass, Selkirk Mountains, B.C. (*Macoun.*) Vicinity of Quebec. (*St. Cyr.*)

(582.) **P. alpinum,** Roehl.; Lesq. & James, Mosses of N. America, 263; Canadian Musci, No. 220.

Polytrichum alpinum, Drumm. Musc. Bor.-Am., No. 282.

Little Bay Islands, Western Cove, Cape Charles and Deep Water Bay, Labrador; on rocks, Harbor Breton and Trinity Bay, Newfoundland. (*Rev. A. Waghorne.*) Rocks of Lake Superior; and in various parts of Canada. (*Drummond.*) On the ground at Restigouche, N.B. (*Fowler's Cat.*) Wet rocks, Tobique River, N.B. (*Hay.*) Canaan Forks, Queen's Co., and Tay, York Co., N.B. (*J. Moser.*) Crevices of rocks Mount Albert, Gaspé Co., Que.; wet rocks, Sudbury Junction, Ont.; crevices of rocks, 10 miles south of Fort William, Lake Superior, also along Nepigon River; on perpendicular rocks, head of Lake Louise, Rocky Mountains; along Bear Creek in Roger's Pass, Selkirk Mountains; on rocks along the Columbia River at Revelstoke; also at Yale on the Fraser River, B.C.; on Mounts Benson and Arrowsmith, Vancouver Island. (*Macoun.*) Wet rocks, Queen Charlotte Islands. (*Dawson.*) Hall Island, St. Paul Island and Ounalaska, Behring Sea. 1891. (*J. M. Macoun.*) Kotzebue Sound and Sitka; (*Roth. Alask.*) Islands in Baffin's Bay. (*R. Brown.*) Frederikshaab, Greenland. (*Fl. Gr.*)

Var. **septentrionale,** Brid. ; Canadian Musci, No. 427.

Polytrichum septentrionale, Drumm. Musc. Bor.-Am., No. 283.

Summit of Rocky Mountains. (*Drummond.*) Abundant on the summit of Copper Mountain, on the south side of the Bow River valley, at Castle Mountain, Rocky Mountains. (*Macoun.*) Greenland. (*Fl. Gr.*) St. Lawrence, St. Paul and St. George islands, Behring Sea. 1891. (*J. M. Macoun.*)

Var. **brevifolium,** Brid.

On rocks, Digge's Island, Hudson Strait. (*R. Bell.*) Greenland. (*Fl. Gr.*)

Var. **microdontium,** Kindb., Ott. Nat. Vol. V.

Differs in the leaves being nearly entire or indistinctly denticulate. St. Paul Island, Behring Sea, 1891. (*J. M. Macoun.*)

(583.) **P. Macounii,** Kindb., Bull. Torr. Bot. Club, XVI. 96; Canadian Musci, No. 546.

Dicœcious ; laxly cæspitose, green, brownish when old. Stem rooting only at base, ascending 8–15 cm. high, dichotomous branching. Leaves very long (1.5-2 cm.); when dry, spreading or patulose, flexuose and convolute ; when humid, subplane, linear-lanceolate ; cuspidate from the short, sheathing, dirty-white base, densely and sharply serrate, spinulose and reddish at back towards the apex ; lamellæ numerous (about 60), entire, each of round hexangular cells, costa long-excurrent ; lower cells of the leaf-base elongate and narrow, the upper oblong, the cell-walls often oblique and irregular. Perichetial leaves shorter and more acute than the other ; seta robust, 3–6 cm. long, pale, finally orange. Vaginule glabrate, pale ; capsule 6 mm. long, obliquely inclined, cylindric-oblong without neck at the base, narrowed below the mouth, constricted, not angulose, finally dark-brown, at first greenish with the mouth orange, 6–7 mm. long and 2 mm. broad ; lid large conic-subulate, at base orange, 2 cm. long ; teeth of peristome 32, short.

This robust and very distinct species is allied to the Japonian *Polytrichum grandifolium,* Lindb.

On rocks and earth in Roger's Pass, Selkirk Mountains ; on rocks at Revelstoke on the Columbia and on earth at Hastings, Burrard Inlet, B.C. ; on the slopes of Mount Arrowsmith, Vancouver Island. (*Macoun.*) On rocks, Alert Bay, Vancouver Island. (*Dawson.*) Prince of Wales Island, Alaska, 1891. (*J. M. Macoun.*)

(584.) **P. polare,** C. Muell., Bot. Zeit. 205. 1859.

Collected in Eastern Greenland and on Sabine Island. (*Pansch.*)

87. POLYTRICHUM, Linn.

(585.) **P. sexangulare,** Flœrke ; Bull. Torr. Bot. Club, XVI., 96 ; Canadian Musci, No. 428.

On the summit of Copper Mountain, south of the Bow River at Castle Mountain, Rocky Mountains ; on Mount Cheops, Selkirk Mountains, alt. 7,500 feet, B.C. ; also on the Gold Range, north of Griffin Lake, B.C., alt. 7,000 feet. (*Macoun.*) Herald Island, north of Alaska. (*Nelson.*) Jakobshavn. (*R. Brown.*) Common in Greenland. (*Fl. Gr.*)

(586.) **P. gracile,** Menz. ; Lesq. & James, Mosses of N. America. 264 ; Canadian Musci, No. 478.

New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Miquelon Island, (*Delàmare.*) Bogs near St. Andrews, N.B. (*Hay.*) Canaan Forks, N.B. (*J. Moser.*) North shore of Lake Superior. (*Agassiz.*) Mer Bleue, 12 miles from Ottawa, Ont. ; on earth near the Gravel Pit, Belleville, Ont. ; on earth and rocks in Roger's Pass, Selkirk Mountains, B.C. ; on earth, Gold Range, north of Griffin's Lake, B.C. ; alt. 7,000 feet. (*Macoun.*) Kotzebue Sound. (*Roth. Alask.*)

(587.) **P. formosum,** Hedw. ; Lesq. & James, Mosses of N. America, 264 ; Canadian Musci, No. 429.

Miquelon Island. (*Delàmare.*) [Bay Bull Arm, Newfoundland. (*Rev. A. Waghorne.*)] (?) On earth in woods, Pelee Point, Lake Erie ; on rocks at Revelstoke, and logs at Hastings, B.C. (*Macoun.*) Sitka Island, Alaska. 1891. (*J. M. Macoun.*) Alaska. (*Nelson.*)

(588.) **P. Ohioense,** Ren. & Card. ; Coult. Bot. Gaz. XIII., 199 ; Canadian Musci, No. 221.

Stem erect, simple or bipartite, 3–6 cm. long, a little tomentose below. Leaves spreading when moist, erect, flexuous when dry, from a sheathing base linear-acuminate, cuspidate, serrate ; lamellæ about 50, each in section of a row of 5–7 cells, the marginal one much larger, transversely dilated, about twice broader than high, very slightly convex, often almost plane. Perichetial leaves longer with a longer hyaline base. Pedicel 4-8 cm. long, reddish below, pale above. Capsule erect, finally horizontal, tetragonal or pentagonal, rarely hexagonal, acute-angled, rather narrowed toward the base, with a very

small or indistinct hypophysis ; length 5–7 mm., diameter 2–2½ mm. ; lid conic-acuminate, red at margin.

This species seems to include the greater part of the specimens formerly referred to *P. formosum*. On the ground at Bass River, N.B. (*Fowler's Cat.*) Canaan Forks, N.B. (*J. Moser.*) Woods, Montcalm Co., Que. (*D'Urban.*) In woods, Becscie River, Anticosti ; woods, North Sydney, Cape Breton ; Mount Stewart and Brackley Point, Prince Edward Island ; along the Ste. Anne de Monts River, Gaspé Co., Que. ; on earth in woods at Casselman, near Ottawa ; on earth in woods in Peterboro and Victoria counties, Ont. ; also at North Bay Lake Nipissing ; at Leamington, Lake Erie ; in woods, near Fort William, Lake Superior ; on earth and rocks along the Columbia River, above Revelstoke, B.C. (*Macoun.*)

(589.) **P. conorhynchum** Kindb. (n. sp.)

Differs from *Polytrichum formosum* in the leaves being canaliculate and the capsule shorter and broader, not attenuate at the base ; differs from *Polytrichum gracile* also in the capsule, which is distinctly acute-angulate, the conic-rostrate lid and the long-sheathing leaves.

In a small bog along the C. P. Railway in Roger's Pass east of the summit, Selkirk Mountains, July 31st, 1890. (*Macoun.*)

(590.) **P. piliferum,** Schreb. ; Lesq. & James, Mosses of N. America, 264 ; Canadian Musci, No. 222 ; Drumm. Musc. Bor.-Am., No. 278.

Grassy Mountains. (*Drummond.*) Gravelly knolls, Bass River, N.B. (*Fowler's Cat.*) Ste. Clotilde, Arthabaska Co., Que. (*St. Cyr.*) Miquelon Island. (*Delàmare.*) On rocks, North West Arm, Halifax, N.S. ; on earth in sandy woods, Murray, Northumberland Co., Ont. ; barren ground and rocks, Lake Nepigon and Lake Nipissing, Ont. ; at Hector, Rocky Mountains ; on rocks at Deer Park and Sproat, Columbia River ; on earth at New Westminster Junction, B.C. ; very common at Victoria and Cedar Hill, also Mount Benson near Nanaimo, Vancouver Island. (*Macoun.*) Vancouver Island. (*Lyall.*) Alaska. (*Nelson.*) Kobbefjord, West Greenland, 28th June, 1884. (*Warming & Holm.*)

Var. **Hoppei,** Rabenh.

On Castle Mountain, Rocky Mountains ; alt. 7,500. (*Macoun.*)

(591.) **P. hyperboreum,** R. Brown, Fl. Melv. Is., 69.

Melville Islands. (*R. Brown.*) Common in Greenland. (*Fl. Gr.*)

(592.) **P. boreale,** Kindb., Laubm. Schwed. & Norweg.

Differing from the nearly allied *P. hyperboreum*, R. Br., principally in the leaves being distinctly dentate above ; the apex is hyaline in the upper part, red in the lower.

St. Paul Island, Behring Sea, 30th July, 1891. (*J. M. Macoun.*)

(593.) **P. juniperinum,** Willd. ; Lesq. & James, Mosses of N. America, 265 ; Canadian Musci, No. 223 ; Drumm. Musc. Bor.-Am., No. 277.

P. commune var. *formosum*, Drumm. Musc. Bor.-Am., No. 276.
P. pallidisetum var. Drumm. Musc. Bor.-Am., No. 280.

Grassy mountainous situations (No. 277) ; about York Factory, Hudson Bay (No. 276) ; upon the " Height of Land," Rocky Mountains (280). (*Drummond.*) Both sides of Baffin's Bay. (*Capt. Ross.*) Smith's Sound. (*Dr. Kane.*) Christianshaab, Greenland. (*Fl. Gr.*) Smith's Sound, between lat. 78°—82°. (*Dr. Hayes.*) Ste. Clotilde, Arthabaska Co., Que. (*St. Cyr.*) Miquelon Island. (*Delàmare.*) Pictou Co., N.S. (*McKay.*) Dry hills and gravelly knolls everywhere in New Brunswick. (*Fowler's Cat.*) Dry places, Tobique River, N.B. (*Hay.*) In woods by stumps, Canaan Forks and Tay, N.B. (*J. Moser.*) Quite common around St. John and Placentia Bay, Newfoundland ; Little Bay Islands, Labrador. (*Rev. A. Waghorne.*) Very abundant from the Atlantic to the Pacific, chiefly in old pastures by stumps and by lumber roads in woods, just as common west of the Rocky Mountains as east of them. (*Macoun.*) Saskatchewan. (*Bourgeau.*) Vancouver Island and British Columbia. (*Lyall.*) Common on knolls in woods and on upturned pine stumps, Dorchester and London, Ont. (*J. Dearness.*) Kotzebue Sound and Nulato. (*Roth. Alask.*)

Var. **Waghornei,** Kindb. (n. var.)

Differs in the leaves being dentate in the upper part, not at the lower arm only ; marginal cells papillose, also other characters as in true *P. juniperinum.*

Deep Water Creek, Venison Tickle and Cape Charles, Labrador, August, 1891. (*Rev. A. Waghorne.*)

(594.) **P. strictum,** Banks ; Lesq. & James, Mosses of N. America, 265 ; Canadian Musci, No. 224.

P. alpestre, Drumm. Musc. Bor.-Am., No. 281.

Swampy places ; frequent. (*Drummond.*) Canaan Forks, N.B. (*J. Moser.*) In swamps at Nain, Labrador. (*R. Bell.*) On rocks, River

Rouge, Argenteuil Co., Que. (*D'Urban.*) Miquelon Island. (*Delàmare.*) Harbor Breton and Broad Cove, Newfoundland. (*Rev. A. Waghorne.*) In bogs, Jupiter River, Anticosti; at Truro, N.S.; Brackley Point, and Otter Pond, Prince Edward Island; on Mount Albert, Gaspé Co., Que.; at Morley and Banff, Rocky Mountains; and common in Roger's Pass, Selkirk Mountains; in bogs, at Blackwater River, and McLeod's Lake, B.C.; also Peace River near Dunvegan, lat. 56°. (*Macoun.*) Mountains south of Tulameen River, B.C.; alt. 6,000 feet. (*Dawson.*) Cascade Mountains, B.C. (*Lyall.*) Kotzebue Sound and Sitka. (*Roth. Alask.*) Jakobshavn, Greenland. (*R. Brown.*) Common in Greenland. (*Fl. Gr.*)

(595.) **P. commune,** Linn.; Lesq. & James, Mosses of N. America, 266.

P. pallidisetum, Drumm. Musc. Bor.-Am., No. 279.

In Canada. (*Drummond.*) Pictou Co., N.S. (*McKay.*) Miquelon Island. (*Delàmare.*) New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Damp shady places; common at Bass River, N.B. (*Fowler's Cat.*) In woods, Belledune, N.B. (*Chalmers.*) Canaan Forks, N.B. (*J. Moser.*) Damp woods, Missinaibi River, Ont. (*R. Bell.*) Common in swamps near London, Ont. (*J. Dearness.*) Sitka. (*Roth. Alask.*) Not uncommon in Greenland. (*Fl. Gr.*)

Var. **perigoniale,** Bruch & Schimp.

In swamps near Stirling, Hastings Co., Ont.; abundant at Pass Creek near Sproat, Columbia River, B.C.; also at McLeod's Lake, lat. 55°, B.C. (*Macoun.*)

Var. **Canadense,** Kindb. (n. var.); Canadian Musci, No. 563.

Polytrichum commune, Canadian Musci, No. 225.

Differs principally in the low stem, about 6–8 cm. high, the pedicel not much longer, the blackish capsule much shorter than in the type which probably is very rare in Canada and only once examined by Kindberg.

On damp earth at Rustico Bay and Royalty Junction, Prince Edward Island; woods, Mount Albert, Gaspé Co., Que.; McKay's woods, Ottawa, also at Belleville, Ont.; damp woods, Lake Nepigon; abundant on earth in the railway cuttings above the trestle at Albert Cañon Station, Selkirk Mountains, B.C., May 29th, 1890. (*Macoun.*)

FAMILY XVIII. BUXBAUMIEÆ.

88. DIPHYSCIUM, Mohr.

(596.) **D. foliosum,** Mohr; Lesq. & James, Mosses of N. America, 267; Canadian Musci, No. 226.

Pictou and Halifax counties, N.S. (*McKay.*) On clay soil, Truro, N.S. (*Fowler's Cat.*) On earth in woods at Rustico Bay, Prince Edward Island; on earth in woods, North Hastings, Ont.; also on earth in woods at Bismarck, Elgin Co., Ont. (*Macoun.*)

89. BUXBAUMIA, Hall.

(597.) **B. aphylla,** Linn.; Lesq. & James, Mosses of N. America, 268.

Milldam, Pictou, Co., N.S. (*McKay.*) On earth, vicinity of Halifax, N.S. (*Lawson.*) On rocks at Chelsea, Que., 8 miles from Ottawa. (*Fletcher.*) On earth along the Columbia River above Revelstoke; on earth and rocks, Deer Park, Lower Arrow Lake, Columbia River; also in woods at Hastings, Burrard Inlet, B.C. (*Macoun.*) Cascade Mountains, B.C. (*Lyall.*)

SERIES II. PLEUROCARPI.

FAMILY XIX. FONTINALEÆ.

90. FONTINALIS, Dill.

(598.) **F. antipyretica,** Linn.; Lesq. & James, Mosses of N. America, 268; Canadian Musci, No. 227; Drumm. Musc. Bor.-Am., No. 232.

Mountain rivulets. (*Drummond.*) Pictou Co., and north-east of Cobequid Mountains, N.S. (*McKay.*) Ponds at Green Island and Broad Cove, Newfoundland. (*Rev. A. Waghorne.*) Miquelon Island. (*Delàmare.*) In brooks, common; Bass River, N.B. (*Fowler's Cat.*) Shallow water, South West Point, Anticosti; on stones in brooks near Ottawa; very common in brooks and larger streams, North Hastings, Ont.; quite common in small brooks along Peace River, near Dunvegan, lat. 56°; in brooks in Roger's Pass, Selkirk Mountains, and at Ward's Ferry, Kootanie River, B.C. (*Macoun.*) British

Columbia. (*Lyall.*) Abundant in a pond, Pond Mills, near London, and in McGillivray Township and in a sluggish stream along Lake Ontario, Ont. (*J. Dearness.*) Greenland; rare. (*Fl. Gr.*)

Var. **gigantea,** Sulliv. ; Canadian Musci, No. 228.

Blaketown, Newfoundland. (*Rev. A. Waghorne.*) Shallow streams, Tobique River, N.B. (*Hay.*) Tay, York Co., and Canaan Forks, Queen's Co., N.B. (*J. Moser.*) In a small stream near Tracadie, Prince Edward Island ; shallow brooks, Truro, N.S. ; small brooks, Hastings, Co., Ont. ; in brooks, Nepigon River, Ont. ; on stones in Eagle River below Griffin Lake, B.C. (*Macoun.*)

* **F. Kindbergii,** Ren. & Card. Coult. Bot. Gaz. XV., 58.

F. Kindbergii, Canadian Musci, No. 233.

On twigs and the bases of trees in a pond at Cedar Hill, and in ditches at Victoria; also at the base of Mount Benson, near Nanaimo, Vancouver Island. (*Macoun.*) Mountains south of Tulameen River, B.C., alt. 5,000 feet. (*Dawson.*) Salmon Arm, Shuswap Lake, B.C. (*Law.*)

(599.) **F. Neo-Mexicana,** Sulliv. & Lesq. ; Lesq. & James, Mosses of N. America, 269 ; Canadian Musci, No. 229.

On stones in brooks near Halifax, N.S. ; abundant in brooks at Hastings, Burrard Inlet, B.C. ; also in the mill-stream at Nanaimo, Vancouver Island. (*Macoun.*)

(600.) **F. Dalecarlica,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 270 ; Canadian Musci, No. 230.

F. squamosa, Drumm. Musc. Bor.-Am., No. 233.

Canaan Forks and Tay, N.B. (*J. Moser.*) Broad Cove near Green Harbor, and Harbor Deep, Newfoundland. (*Rev. A. Waghorne.*) In a rivulet at Holland Landing (Ontario). (*Drummond.*) On stones in the brook at Pirate's Cove, Straits of Canso, N.S. ; abundant in Gull River, Victoria Co., Ont. ; in streams entering Lesser Slave Lake, Athabasca. (*Macoun.*) River Thames at Plover Mills, Ont. (*R. Elliott.*) In the River Thames, near London, Ont. (*J. Dearness.*) Greenland. (*Fl. Gr.*)

(601.) **F. biformis,** Sulliv. ; Lesq. & James, Mosses of N. America, 270.

In the brook flowing eastward through Eagle Pass and entering the Columbia below Revelstoke, B.C. (*Macoun.*)

(602.) **F. Novæ-Angliæ,** Sulliv.; Lesq. & James, Mosses of N. America, 270.

F. tenella, Ren. & Card.; Canadian Musci, No. 432.

The mill-brook near Green Harbor, Newfoundland. (*Rev. A. Waghorne.*) On stones in brooks at Yarmouth, N.S.; in brooks north of Edmonton, N.W.T.; abundant and fruiting freely on the bases of growing trees along the "Narrows" at Sicamous, B.C.; also on trees at the mouth of the first creek, Deer Park, Lower Arrow Lake, B.C. (*Macoun.*)

(603.) **F. disticha,** Hook. & Wils.; Lesq. & James, Mosses of N. America, 272.

F. Lescurii, Canadian Musci, No. 231.

In brooks along Lake Nepigon, Ont.; in pools, Peace River, lat. 56°; Telegraph Trail, near Blackwater River, B.C.; also at Victoria, Vancouver Island. (*Macoun.*)

(604.) **F. hypnoides,** Hartm.; Lesq. & James, Mosses of N. America, 272; Canadian Musci, No. 232.

On stones in a small woodland brook near Belleville, Ont.; in Thunder Creek, west of Moose Jaw, Assiniboia; on stones in brooks Manitoba House, Lake Manitoba; on stones in Red Deer River, near the Hand Hills, Alberta; in a small brook at Revelstoke, B.C. (*Macoun.*) Saskatchewan. (*Bourgeau.*)

(605.) **F. squamosa,** Linn.

Miquelon Island. (*Delàmare.*)

91. DICHELYMA, Myrin.

(606.) **D. obtusulum,** Kindb. (n. sp.)

D. Novæ-Brunsviciæ, Canadian Musci, No. 534.

Tufts dusky-green or olivaceous. Stems flaccid, subpinnate; branches short. Leaves falcate, from the broader sub-oblong base gradually narrowed to the sublinear-lanceolate, obtuse or rarely subacute acumen, carinate, denticulate to or below the middle, sub-decurrent; upper cells oblong-lanceolate, the other narrower, sub-linear, the basal rufescent but otherwise scarcely distinct, the alar longer and narrower; costa vanishing below the apex. Perigonial leaves nerveless, ovate-oblong, acute. Perichetial leaves lanceolate, obtusate and

convolute. Capsule sub-cylindric, shortly emerging from the side of the perichetium. Dicœcious.

This species has the habit of *Dichelyma falcatum;* and is the *D. falcatum* of Prof. Fowler's New Brunswick list.

Collected in still water, Bass River, N.B. (*Fowler's Cat.*)

(607.) **D. uncinatum,** Mitt.; Lesq. & James, Mosses of N. America, 273; Canadian Musci, No. 234.

On twigs in ponds at McLeod's Lake, lat. 55°; also abundant on trees at the mouth of Pass Creek, near Sproat, B.C. (*Macoun.*)

(608.) **D. capillaceum,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 273; Canadian Musci, No. 431.

Fontinalis capillacea, Drumm. Musc. Bor.-Am., No. 234.

Grand Lake and Newcastle, N.B. (*Fowler's Cat.*) On sticks in brooks, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On the roots of trees, bordering the rivulet at Holland Landing (Ontario). (*Drummond.*)

Var. **elongatum,** Kindb. (n. var.)

Stems more elongate, branches more distant, the leaf-base longer than the excurrent part of the costa.

In the bed of a small brook, 30 miles north of Michipicotin River, Lake Superior, July 27th, 1869. (*Macoun.*)

(609.) **D. pallescens,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 274; Canadian Musci, No. 235.

Dead wood, River Rouge, Argenteuil Co., Que. (*D'Urban.*) Abundant on the bases of trees in the inundated woods at the mouth of the Gatineau, near Hull, Que.; also on twigs in water-holes near St. Patrick's Bridge, Ottawa. (*Macoun.*) On bases of trees, Bass River and Fredericton, N.B. (*Fowler's Cat.*) Tay, York Co., N.B. (*J. Moser.*)

(610.) **D. cylindricarpum,** Aust.; Lesq. & James, Mosses of N. America, 274.

On damp rocks in the Coast Range above Yale, B.C., May 17th, 1875. (*Macoun.*) The specimens gathered here were the same as those sent to Austin by Mrs. Roy and labelled Cascade Mountains.

XX. NECKEREÆ.

92. LEPTODON, Mohr.

(611.) **L. trichomitrion,** Mohr; Lesq. & James, Mosses of N. America, 278; Canadian Musci, No. 236.

Pterogonium trichomitrion, Drumm. Musc. Bor.-Am., No. 78.

Trunks of trees in upper Canada (Ontario); about Niagara Falls. (*Drummond.*) On trees in a swamp a little east of Belleville, Ont. (*Macoun.*)

(612.) **L. nitidus,** Lindb. MS.; Lesq. & James, Mosses of N. America, 279.

On elm trees in a swamp (since cleared up) a little east of Belleville Ont., July 20th, 1864. (*Macoun.*)

93. ALSIA, Sulliv.

(613.) **A. abietina,** Sulliv.; Lesq. & James, Mosses of N. America, 280.

A. Macounii, Kindb., Bull. Torr. Bot. Club. XVII., 275; Canadian Musci, No. 462.

On trees North-west Coast. (*Menzies.*) Vancouver Island. (*Lyall.*) On rocks, Fraser River above Yale, B.C.; on rocks, Salt Spring Island, Gulf of Georgia, B.C.; on trees at Michosen, near Victoria, Vancouver Island. (*Macoun.*) Alaska. (*Roth. Alask.*)

94. NECKERA, Hedw.

(614.) **N. Menziesii,** Drumm.; Lesq. & James, Mosses of N. America, 282; Canadian Musci, No. 238; Drumm. Musc. Bor.-Am., No. 162.

On rocks amongst the Rocky Mountains, but without fruit. (*Drummond.*) On rocks, below Hector, "Dry Cañon," discharge of Devil's Lake, and at Banff, Rocky Mountains; on rocks, Roger's Pass, Selkirk Mountains; on rocks at Sicamous, B.C.; abundant on trees at the mouth of Harrison River and at Harrison Hot Springs, B.C.; very common on trees and rocks, Victoria and Comox, Vancouver Island. (*Macoun.*) Alaska. (*Roth. Alask.*)

Var. **amblyclada,** Kindb. (n. var.); Canadian Musci, No. 567.

Neckera oligocarpa, Canadian Musci, No. 240, in part.

Differs in the densely pinnate stems, the branches obtuse, rarely attenuate and flagelliferous, the leaves shorter, sub-oblong. It agrees with the common form in the paraphylliferous stem, &c. Barren.

On rocks beside the torrent at Hector, Rocky Mountains, B.C., July 15th, 1885. (*Macoun.*)

(615.) **N. pennata,** Hedw.; Lesq. & James, Mosses of N. America, 282; Canadian Musci, No. 239; Drumm. Musc. Bor.-Am., No. 161.

Trunks of trees, abundant; rarely on rocks. (*Drummond.*) Common, Pictou Co., N.S. (*McKay.*) On trees; common, N.B. (*Fowler's Cat.*) Canaan Forks, Queen's Co., Tay, York Co. and Elmwood, King's Co., N.B. (*J. Moser.*) Trunks of trees, River Rouge, Argenteuil Co., Que. (*D'Urban.*) On trees, Whycocogmah, Cape Breton; common on trees Prince Edward Island; also on trees at Campbellton, N.B.; in woods, Gaspé Co., Que.; abundant in elm and black ash swamps at Ottawa, Belleville, Leamington, Port Dover, Owen Sound and Niagara, Ont.; on trees, Nepigon River, Ont.; on trees along Lake Winnipegoosis, Man. (*Macoun.*) Common on bark of trees, London, Ont. (*J. Dearness.*)

(616.) **N. oligocarpa,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 283; Canadian Musci, No. 240, in part.

On trees at Rustico Bay, Prince Edward Island; on trees at Ottawa, Ont.; on rocks at Nepigon, Lake Superior, June 24th, 1884; and on rocks, Kicking Horse Lake, Rocky Mountains; underneath overhanging rocks, Rocky Mountain Cañon, Peace River, lat. 56°. (*Macoun.*)

* **N. peterantha,** C. M. & Kindb. (n. subsp.)

Differs in the secondary stems being nearly simple, about 1 decim. long, rigid and more robust, the antheridia and archegonia very numerous, the capsule emergent, the leaves larger, and more crowded, the one branch of the costa prolonged, sometimes to the middle.

Common on rocks in the Kicking Horse Pass, three miles below Hector, Rocky Mountains, August 13th, 1890. (*Macoun.*)

(617.) **N. Douglasii,** Hook.; Lesq. & James, Mosses of N. America, 283; Canadian Musci, No. 241.

North-west Coast. (*Menzies.*) Alaska. (*Roth. Alask.*)

Var. **Macounii,** Kindb., Bull. Torr. Bot. Club, XVII., 275; Canadian Musci, No. 389.

Differing principally in the leaves being less attenuate and the capsule turgid-oval, completely exserted on the long pedicel (not "narrow half-exserted").

The true *N. Douglasii* has a narrower sub-cylindric capsule in specimens collected by Henderson (herb. *Kindberg*); but the capsule is also exserted; probably the description in Lesq. & James is not correct.

Hanging in long festoons from the limbs of trees in shady woods at Hastings and Agassiz, B.C.; and at Victoria, Nanaimo and Comox, Vancouver Island. (*Macoun.*)

(618.) **N. complanata,** Hueben.; Lesq. & James, Mosses of N. America, 283.

On rocks, New Brunswick. (*Lesq. & James.*) Common, Pictou Co., N.S. (*McKay.*) New Harbor, Newfoundland; and Little Bay Islands, Labrador. (*Rev. A. Waghorne.*)

95. HOMALIA, Brid.

(619.) **H. Macounii,** C. M. & Kindb. (n. sp.)

H. trichomanoides, Lesq. James, Mosses of N. America, 285; Canadian Musci, No. 242.

H. obtusata, Mitt.; Lesq. & James, Mosses of N. America, 285; Canadian Musci, No. 243.

Hypnum trichomanoides, Drumm. Musc. Bor.-Am., No. 171.

Very nearly allied to *Homalia trichomanoides;* differs in the leaves being longer, rather lingulate, the lowest basal cells yellow, the perichetial leaves more suddenly narrowed to the very short acumen, the segments of the peristome cleft between the articulations.

The Asiatic *Homalia obtusata* (in herb. *C. Mueller*) is very different, probably not found in North America.

On rocks about Lake Superior; but rare. (*Drummond.*) On trees at Pirate's Cove, Straits of Canso, N.S.; on earth along Hunter's River, Prince Edward Island; on the face of perpendicular rocks, Ste. Anne des Monts River, Gaspé Co., Que.; on the bases of trees west of Ottawa, and on limestone rocks in McKay's woods, Ottawa; on rocky ledges, Flinton, Hastings Co., and at Sudbury Junction and along the Dawson Route, west of Lake Superior, Ont. (*Macoun.*) On rocks, New Harbor, Newfoundland. (*Rev. A. Waghorne.*) On rocks, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On rocks along the Columbia River above

Revelstoke; and on logs on the overflowed banks of the Fraser at Mission, B.C.; on earth on the bank of the river at Comox, Vancouver Island. (*Macoun.*)

96. METEORIUM, Brid.

(620.) **M. nigrescens,** Mitt.; Lesq. & James, Mosses of N. America, 287.

Lake Huron; in fruit. (*Dr. Todd.*) Canada West. (*Emery.*)

XXI. LEUCODONTEÆ.

97. LEUCODON, Schwaegr.

(621.) **L. sciuroides,** Schwaegr; Lesq. & James, Mosses of N. America, 288; Canadian Musci, No. 237.

On the bark of trees, Bass River, N.B. (*Fowler's Cat.*) On trees, Queen's Co., N.B. (*J. Moser.*) On trees, Rustico Bay, Prince Edward Island; on trees along the Gaspé coast, Que.; common on trees at Ottawa, Belleville, Leamington, Owen Sound and throughout Ontario; fruiting very seldom. (*Macoun.*) On trees at Owen Sound, Ontario. (*Mrs. Roy.*) On bark of maples near London, Ont. (*J. Dearness.*)

(622.) **L. brachypus,** Brid.; Lesq. & James, Mosses of N. America, 288.

On trees along the Gaspé coast, Que.; high up on maple trunks at Owen Sound, Ont. (*Macoun.*) On trees near Pictou, N.S. (*McKay.*)

98. PTERIGYNANDRUM, Hedw.

(623.) **P. filiforme,** Hedw.; Lesq. & James, Mosses of N. America, 289; Canadian Musci, No. 244.

Pterogonium filiforme, Drumm. Musc. Bor.-Am., No. 77.

Rocks on the Portage River, Rocky Mountains. (*Drummond.*) Bass River, Kent Co., N.B. (*Fowler's Cat.*) On rocks, Ste. Anne des Monts River, Gaspé Co., Que.; on flat limestone rocks along the Moira, above the railway bridge, at Belleville, Ont.; on rocks, three miles below Hector, Rocky Mountains; also on rocks in Roger's Pass, Selkirk Mountains; on rocks at Revelstoke, Deer Park and Pass Creek, Columbia River;

also at Eagle Pass and Sicamous in the Gold Range, B.C.; on rocks at Yale and Agassiz, B.C. (*Macoun.*) Greenland. (*Fl. Gr.*)

(624.) **P. papillosulum,** C. M. & Kindb. (n. sp.); Canadian Musci, No. 553.

Differs from *Pterigynandrum filiforme* in the branch-leaves being acuminate and acute, denticulate nearly all around, less papillose; the branchlets are blunt and turgid, as in the variety *heteropterum* of this species.

On rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C., June 4th, 1890. (*Macoun.*)

99. PTEROCONIUM, Swartz.

(625.) **P. brachypterum,** Mitten; Lesq. & James, Mosses of N. America, 290.

British North America. (*Drummond.*) On old logs at the mouth of Sturgeon Creek, near Leamington, Ont. (*Macoun.*)

100. ANTITRICHIA, Brid.

(626.) **A. curtipendula,** Brid.; Lesq. & James, Mosses of N. America, 291.

Lake Superior. (*Agassiz.*) Miquelon Island. (*Delàmare*). Placentia Bay, Newfoundland. (*Rev. A. Waghorne.*) Greenland. (*Fl. Gr.*)

Var. **gigantea,** Sulliv. & Lesq.; Canadian Musci, No. 245.

Vancouver Island. (*Wood.*) British Columbia. (*Lyall.*) On trees at Revelstoke, Columbia River Valley; on rocks at Yale and on trees at Hastings, Burrard Inlet, B.C.; very common on trees at Victoria, Nanaimo and Comox, Vancouver Island. (*Macoun.*) Harpledown Island, Gulf of Georgia and on trees at Alert Bay, Vancouver Island. (*Dawson.*) Sitka. (*Roth. Alask.*) Ounalaska, Behring Sea and Kodiak Island, Alaska. 1891. (*J. M. Macoun.*)

(627.) **A. tenella,** Kindb., Bull. Torr. Bot. Club. XVII. 275.

Tufts loose, green; secondary stems irregularly divided; branchlets numerous, the greater number very short. Leaves small, sub-patent or loosely appressed when dry, ovate-acute or short-acuminate, dentate at the apex, not striate, reflexed to the apex; the greater number of cells short, the inner and middle narrow; costa with 1-2 accessorial

branches at the base, disappearing below the apex ; perigonial leaves elongate. Dicecious. Female plants unknown.

Amongst *Racomitrium varium* (Can. Musc. No. 100) on rocks on the left bank of the Nanaimo River below the railway bridge, Vancouver Island, April 26th, 1887. (*Macoun.*)

(628.) **A. Californica,** Sulliv. ; Lesq. & James, Mosses of N. America, 291 . Canadian Musci, No. 246.

On rocks at Deer Park, Lower Arrow Lake, Columbia River ; on rocks at Yale ; on trees at the mouth of Harrison River and rocks at Agassiz, Fraser Valley, B.C. ; on trees near Victoria and at Comox, Vancouver Island. (*Macoun.*) Alaska. (*Roth. Alask.*)

XXII. HOOKERIEÆ.

101. PTERYGOPHYLLUM, Brid.

(629.) **P. lucens,** Brid. ; Lesq. & James, Mosses of N. America, 293 ; Canadian Musci, No. 247.

In water pools and borders of marshes in the springtime, along the Columbia River, above Revelstoke, also by pools in woods at Hastings, B.C. ; wet places in woods around Comox, Vancouver Island. (*Macoun.*)

XXIII. FABRONIEÆ.

102. FABRONIA, Raddi.

(630.) **F. pusilla,** Raddi. ; Lesq. & James, Mosses of N. America, 294 ; Canadian Musci, No. 508.

Crevices of steep rocks over which water trickles in spring at Deer Park, Lower Arrow Lake, Columbia River, B.C., June 8th, 1890. (*Macoun.*)

XXIV. LESKEEÆ.

103. THELIA, Sulliv.

(631.) **T. compacta,** Kindb., Ott. Nat. Vol. IV. 62.

T. hirtella, Canadian Musci, No. 248.

Stems closely creeping. Tufts green, very dense and thick. Branches erect, terete, obtuse and unilateral. Paraphyllia none. Leaves cochleariform, rotundate-obtuse and short-apiculate, very

scabrous at the back, with simple incurved papilliferous ciliæ; borders spinulose-dentate or fimbriate-ciliate; ciliæ long, curved up and dentate; costa obsolete or very short. Perichetial leaves oblong-lanceolate, narrowly-acuminate, fimbriate. Capsule pale-brown, ovate-cylindrical; teeth subulate, short and broad, sometimes horizontally divaricate when moist, distantly articulate, dusky, the upper article cleft; basilar membrane short, scarcely $\frac{1}{4}$ the length of the teeth, without segments; operculum conic-obtuse, not curved, $\frac{1}{3}$ the length of the capsule; pedicel smooth, scarcely 1 cm. long. Differs from *Thelia hirtella* in the longer branches, the larger and more pellucid leaves, the greater leaf-cells and the longer and thicker capsule, also in the peristome.

Abundant on the stems of young maples in the central counties of Ontario. It forms wide rings around the tree about four feet from the ground and fruits abundantly. Vicinity of Belleville and in Seymour, Northumberland Co., Ont. (*Macoun.*) On trees at Canaan Forks, Queen's Co., N.B. (*J. Moser.*)

(632.) **T. hirtella,** Sulliv.; Lesq. & James, Mosses of N. America, 299; Canadian Musci, No. 439.

Pterogonium hirtellum, Drumm. Musc. Bor.-Am., No. 79.

On trees, Upper Canada (Ontario.) (*Drummond.*) On the roots of trees in woods at Leamington, Ont. (*Macoun.*) On trees in woods at Collins Bay, near Kingston, Ont. (*Lawson.*)

(633.) **T. asprella,** Sulliv.; Lesq. & James, Mosses of N. America, 299.

On earth at the bases of trees at the south end of Pelee Point, Lake Erie, Ont. (*Macoun.*)

104. MYURELLA, Bruch & Schimp.

(634.) **M. julacea,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 300; Canadian Musci, No. 249.

Hypnum moniliforme, Drumm. Musc. Bor.-Am., No. 220.

Rocks and banks; but rare in fruit. (*Drummond.*) On ledges, Kakabeka Falls, west of Lake Superior. (*Mrs. E. G. Britton.*) On the bases of trees (fruiting) Gunn River, Anticosti; on the bases of trees Mount Albert, Gaspé Co., Que.; on old stumps in Dow's Swamp, Ottawa; abundant and fruiting on the base of cedar stumps in swamps at Belleville, Ont.; on limestone rocks, Point Wilkins, Lake Winni-

pegoosis, Man. ; on rocks, House Mountain, near Lesser Slave Lake, N.W.T. ; in the " Dry Cañon," discharge of Devil's Lake, on rocks at Hector and along the Kicking Horse Pass to Mount Stephen, Rocky Mountains. (*Macoun.*) On damp rocks, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Upernivik, Greenland. (*Fl. Gr.*) White Bay, Newfoundland ; Battle Harbor, Labrador. (*Rev. A. Waghorne.*)

(635.) **M. apiculata,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 300.

British America. (*Drummond* fide *Lesq. & James.*) Greenland. (*Fl. Gr.*)

(636.) **M. Careyana,** Sulliv. ; Lesq. & James, Mosses of N. America, 300 ; Canadian Musci, No. 250.

M. gracilis, (Weinm.) Lindb.

On rocks, St. John, N.B. (*Fowler's Cat.*) Crevices of rocks, Queen's Co., N.B. (*J. Moser.*) Crevices of rocks, Pirate's Cove, Straits of Canso, N.S. ; limestone rocks, Jupiter River, Anticosti ; on rocks, near Cape Rosier, at Madeline River and Ste. Anne des Monts River Gaspé Co., Que. ; on a limestone ledge west of Hull, Que. ; on limestone rocks along the Moira at Belleville, Ont. ; quite common on limestone rocks at Owen Sound, Ont. ; and in crevices of rocks, Red Rock, Lake Superior. (*Macoun.*) On ledges, Kakabeka Falls, west of Lake Superior. (*Mrs. E. G. Britton.*)

105. LESKEA, Hedw.

(637.) **L. polycarpa,** Ehrh. ; Lesq. & James, Mosses of N. America, 301 ; Canadian Musci, No. 251.

Hypnum medium, Drumm. Musc. Bor.-Am., No. 223.

About the roots of trees in swamps. (*Drummond.*) On trunks of trees subject to inundation ; Bass River, Newcastle, Grand Lake and Fredericton, N.B. (*Fowler's Cat.*) Roots of trees, Tobique River, and Lac Bean, St. Francis, N.B. (*Hay.*) Tay, York Co., N.B. (*J. Moser.*) Very abundant on the inundated flats at the mouth of the Gatineau near Ottawa ; on the bases of trees on the river flats two miles above the railway bridge at Trenton, Ont. ; on trees at Sudbury Junction, Ont. ; abundant on trees, Foster's Flats, below Niagara Falls ; on trees, Dawson Route west of Lake Superior ; on trees subject to inundation at Sicamous and Kamloops, B.C. (*Macoun.*)

(638.) **L. cyrtophylla,** Kindb. (n. sp.)

Tufts dense, dark green or brown, not shining. Stems irregularly branching, filiform, with few rhizoids. Leaves nearly uniform, very small, appressed when dry, open-erect when moist, concave, from a broad rotundate-ovate base short-acuminate, entire, faintly papillose, borders reflexed below ; cells rotundate, sub-hyaline ; costa indistinct or none. Dicœcious. Capsules not found.

The allied *Leskea* (Pseudoleskea) *catenulata* and *Leskea* (Heterocladium) *papillosa*, Lindb., both differ in the costate leaves.

On rocks on islands in Lake Nepigon, July 10th,. 1884. (*Macoun.*)

(639.) **L. subobtusifolia,** C. M. & Kindb. (n. sp.) ; Canadian Musci, No. 533.

Plants loosely tufted, yellowish green or fuscescent. Stem sparingly radiculose, irregularly divided, beset with paraphyllia ; branches curved at apex. Leaves distant, decurrent, entire, distinctly papillose at back, loosely appressed when dry, very patent when moist, margins recurved at the base ; stem-leaves broadly ovate, obtuse or subacute, branch-leaves oblong, obtuse ; cells round, the alar quadrate ; costa sub-percurrent. Capsule oblong, inclined, subcurvate ; lid short, mammillate ; calyptra narrow, cucullate : pedicel about 1 cm. long. Perichetial leaves large, short, ovate-lanceolate, short-acuminate, costate. Monœcious. This species resembles *Leskea obscura.*

On trees subject to inundation at the mouth of Pass Creek, near Sproat, Columbia River, B.C.. June 19th, 1890 ; also on trees at Nelson, Kootanie River, B.C. 1890. (*Macoun.*)

(640.) **L. nervosa,** Myrin ; Lesq. & James, Mosses of N. America, 302 ; Canadian Musci, No. 252, in part.

Battle Harbor, Labrador. (*Rev. A. Waghorne.*) On trees at Fredericton, N.B. (*Fowler's Cat.*) On rocks at the mouth of Michaud River, Rimouski Co., Que. (*J. A. Allen.*) Tay, York Co., N.B. (*J. Moser.*) On trees, Grand Etang, Gaspé Co., Que. ; also on Mount Albert, Gaspé, Que. ; on trees at Ottawa, Belleville and Owen Sound, Ont. ; and on trees on Gaulois Point, Lake Superior ; on trees, Swan Lake House and Point Wilkins, Lake Winnipegoosis, Man. ; on rocks, "Dry Cañon," discharge of Devil's Lake, Rocky Mountains ; on trees at Pass Creek near Sproat, B.C. ; also on rocks at Yale, B.C. (*Macoun.*) On trees, Buffalo Lake, N.W.T. (*J. M. Macoun.*)

(641.) **L. denticulata,** Sulliv.; Lesq. & James, Mosses of N. America, 302.

On trees at Canaan Forks, Queen's Co., N.B. (*J. Moser.*)

(642.) **L. pulvinata,** Wahl.; Lesq. & James, Mosses of N. America, 303; Canadian Musci, No. 253.

On trees along Peace River, at Hudson Hope, lat. 56°; also on trees by ponds at McLeod's Lake, B.C., lat. 55°. (*Macoun.*)

(643.) **L. Wollei,** Aust.; Lesq. & James, Mosses of N. America, 304.

Niagara Falls. (*Wolle.*) On rocks east shore of Lake Superior. (*Macoun.*) This species belongs rather to the genus *Amblystegium.*

106. LESCURÆA, Schimp.

(644.) **L. imperfecta,** C. M. & Kindb. (n. sp.); Canadian Musci, No. 489.

Tufts loose, green, not shining. Stem pinnate, radicant; paraphyllia few. Stem-leaves smooth, decurrent, often bistriate, from a short-ovate base suddenly narrowed into a long subulate or filiform, often curved acumen, when dry loosely appressed with a patent acumen, distant and patent-open when moist; basal margins recurved; branch-leaves long-attenuate; inner cells near the costa oblong-sublinear, the marginal subquadrate, the other oval-oblong; costa vanishing in the base of the acumen. Perichetial leaves nerveless; cells sublinear. Capsule small, oblong, straight; lid conic, subobtuse; peristome double, teeth incurved, cilia short or none, basal membrane indistinct; pedicel smooth, fine, flexuous, about 6 mm. long. Dicœcious. Allied to the European *Lescuræa striata,* (Schw.) Schimp. Bryol. Europ.

On both earth and bark at the bases of trees on both sides of the Columbia River at Revelstoke, B.C., May 19th, 1890. (*Macoun.*)

107. ANOMODON, Hook. & Tayl.

(645.) **A. rostratus,** Schimp.; Lesq. & James, Mosses of N. America, 305; Canadian Musci, No. 254.

Hypnum rostratum, Drumm. Musc. Bor.-Am. No. 228.

About Beaver Lake, Upper Canada, &c. (*Drummond.*) Pictou Co., N.S. (*McKay.*) Fredericton, N.B. (*Fowler's Cat.*) On rocks, Canaan Forks, Queen's Co., and Tay, York Co., N.B. (*J. Moser.*) On

rocks along the Gaspé coast, Que.; very common on the bases of trees in swamps and on rocks throughout Ontario. Ottawa, Belleville, Leamington and Amherstburg, Detroit River; on rocks, Mount Benson, Vancouver Island. (*Macoun.*) On the bases of trees, Nixon's Pond, near London, Ont. (*J. Dearness.*)

(646.) **A. attenuatus,** Hueben.; Lesq. & James, Mosses of N. America, 305; Canadian Musci, No. 255.

Hypnum attenuatum, Drumm. Musc. Bor.-Am., No. 226.

About the roots of trees in Upper Canada (Ontario.) (*Drummond.*) Common; Pictou Co., N.S. (*McKay.*) On roots of trees, Truro, N.S.; also Fredericton, N.B. (*Fowler's Cat.*) Bases of old trees and stumps, Canaan Forks, N.B. (*J. Moser.*) Bases of trees, Tobique River, N.B. (*Hay.*) On the bases of trees, Whycocogmah, Cape Breton; on old logs and the bases of trees in swamps, common in Quebec and Ontario; Ste. Anne des Monts River, Gaspé, Que.; Ottawa, Belleville, Lake Nipissing, Lake Nepigon, Wooler, Leamington and Owen Sound, Ont.; on the bases of trees at Sicamous, B.C., 1889. (*Macoun.*) Roots of trees, River Rouge, Argenteuil, Co., Que. (*D'Urban.*) On the bases of trees at London, Ont. (*J. Dearness.*)

(647.) **A. obtusifolius,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 305; Canadian Musci, No. 256.

A. viticulosum, Drumm. Musc. Bor.-Am., No. 163.

Tay, York Co., N.B. (*J. Moser.*) Abundant on the bases of trees in damp woods at Ottawa and westward through Ontario to Belleville, Wooler and Owen Sound. (*Macoun.*) Trunks of trees, River Rouge, Argenteuil Co., Que. (*D'Urban.*) On *Ostrya* in woods at London, Ont. (*J. Dearness.*) Trunks of trees in Upper Canada (Ontario) and about Niagara Falls. (*Drummond.*)

(648.) **A. apiculatus,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 306; Canadian Musci, No. 257.

On decayed logs, but chiefly on limestone rocks in woods at Ottawa; on rocks at Shannonville, Hastings Co.; on old logs, Kennebec, Addington Co,; and on limestone rocks, Owen Sound, Ont. (*Macoun.*)

(649.) **A. viticulosus,** Hook. & Tayl.; Lesq. & James, Mosses of N. America, 306; Canadian Musci, No. 258.

Shaded rocks; Niagara Falls, sterile. (*Lesq. & James.*) Owen Sound, Ont.; fertile. (*Mrs. Roy.*) Common on limestone ledges

west and north of Hull, Que.; also in McKay's woods at Ottawa; very abundant on limestone ledges all around Owen Sound, Ont. (*Macoun.*)

(650.) **A. heteroideus,** Kindb. (n. sp.)

Leskea nigrescens, Kindb. Bull. Torr. Bot. Club, XVI., 97; Canadian Musci, No. 395 and No. 252, in part.
L. nervosa var. *flagellifera,* Kindb. Ott. Nat. Vol. IV. 62.

Plants densely tufted, green, finally fuscescent or blackish. Stem creeping, subpinnate, much branching and furnished with numerous small, flagelliform branchlets, densely beset with very small, oblong, obtuse and nerveless leaves; paraphyllia broad. Stem-leaves subdistant, decurrent, appressed when dry, open-erect when moist, from a broadly ovate base suddenly narrowed to a long, subulate or sublinear acumen, entire, faintly papillose; margins revolute at the base; branch-leaves more attenuate; cells round-oval, the marginal of the base quadrate; costa vanishing below the acumen. Dœcious. Fruiting specimens not found. This species resembles *Leskea nervosa* in habit.

On flat limestone rocks and on the roots of trees in McKay's woods, Ottawa; also on flat limestone rocks in maple woods at Owen Sound, Ont.; on rocks, "Dry Cañon," discharge of Devil's Lake, Rocky Mountains. (*Macoun.*)

108. PLATYGYRIUM, Bruch & Schimp.

(651.) **P. repens,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 307.

P. repens var. *orthocladon,* Kindb.; Canadian Musci, No. 259, in part.
Neckera sericea, Drumm. Musc. Bor.-Am., No. 159.
Pterogonium intricatum, Drumm. Musc. Bor.-Am., No. 75.

Baie St. Paul, Charlevoix Co., Que. (*St. Cyr.*) Common on rotten wood at London, Ont. (*J. Dearness.*) On dead wood, Tobique River, N.B. (*Hay.*) Tay, York Co., N.B. (*J. Moser.*) On old logs, Skead's Farm, Ottawa; and on trees at Peace River, lat. 56°, N.W.T. (*Macoun.*) Rocks amongst the Rocky Mountains; at Portage River; Beaver Lake and in Upper Canada (Ontario) upon trunks of trees and stones. (*Drummond.*)

Var. **orthoclados,** Kindb. (n. sp?); Canadian Musci, No. 259, in part.

Branches elongate and not curved. All basal leaf-cells orange. Segments linear, not completely free at base, smooth or denticulate at one side, not shorter than the teeth.

The European species differs in the peristomial teeth being pale,

generally longer than the linear-subuliform, hyaline-bordered and free segments; the branches of the stem are shorter and curved, only the alar leaf-cells orange. The figure given by Schimper and Lesq. & James representing the peristome does not correspond with the specimens.

On old logs, Skead's Farm, near Ottawa, May 15th, 1885. (*Macoun.*)

109. PYLAISIA, Bruch & Schimp.

(652.) **P. polyantha,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 308; Canadian Musci, No. 260.

Hypnum polyanthos, Drumm. Musc. Bor.-Am., No. 222.

Trunks of trees, stones and logs in woods. (*Drummond.*) On trees, Bass River, N.B. (*Fowler's Cat.*) On trees, Tobique River, N.B. (*Hay.*) On the bases of trees at Canaan Forks and Tay, N.B. (*J. Moser.*) On trees, Rustico Bay, Prince Edward Island; also on logs at Campbellton, N.B.; on trees along the Gaspé Coast, Que.; on rotten logs at Ottawa and Belleville, and on trees at Lake Nepigon, Ont.; on stumps and poplar trees in woods at Sydenham Falls, Owen Sound, Ont.; on the bases of aspen poplar trees throughout the prairie region and northward to Peace River; on stumps at Morley and on stones at Banff, Rocky Mountains. (*Macoun.*) On trees along the Clearwater River, N.W.T. (*J. M. Macoun.*) Saskatchewan and Rocky Mountains. (*Bourgeau.*) Near London, Ont. (*J. Dearness.*)

(653.) **P. heteromalla,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 308; Canadian Musci, No. 261.

On trees along Niagara River at the Whirlpool; on trees, abundant at Edmonton and Lesser Slave Lake, also in the Peace River district and at Yale, B.C., 1875. (*Macoun.*) On trees along the Clearwater River, N.W.T., lat. 57°. (*J. M. Macoun.*) Trunks of trees and stones in various situations; Rocky Mountains. (*Drummond* No. 222.)

(654.) **P. pseudo-platygyrium,** Kindb. (n. sp.)

Tufts intricate; stems irregularly divided or subpinnate; branches thick. Leaves crowded, the upper glossy-green, the other finally brown, from the ovate-oblong base long-acuminate with a sub-filiform, often curved, distinctly denticulate acumen; borders recurved to the acumen; cells narrow and confluent, except the quadrate alar ones; costa double, distinct. Perichetial leaves serrulate, abruptly narrowed to the long, hairpoint-like acumen. Capsule straight, suberect, cylindric

and wide-mouthed ; segments free, longer than the teeth ; lid conic, short-apiculate ; pedicel 1.5 cm. long. Monœcious.

This species resembles *Platygyrium repens* (or rather some forms of *Hypnum cupressiforme*), but it differs in the monœcious inflorescense and the denticulate leaves.

It agrees with *Pylaisia Selwynii* in the recurved leaf-borders, differs in the narrower leaves and the narrow capsule. It differs also from *Pylaisia subdenticulata* in the larger and more crowded leaves and larger capsule ; from *Hypnum reptile* in the peristome, the basal cells not being yellow, &c.

On decayed trunks near Nepigon House, Lake Nepigon, July 17th, 1884. (*Macoun.*)

(655.) **P. Selwynii,** Kindb., Ott. Nat. II., 156 ; Canadian Musci, No. 434.

Differs from *P. intricata* in the denser, darker green tufts, the leaves broader, short-acuminate, reflexed to the acumen at one border or at both, the short alar and marginal cells more numerous, the capsule short-oval, the segments adhering to two-thirds of the teeth.

Very abundant on old cedar fences along the Richmond Road, three miles west of Ottawa, Oct. 12th, 1885. (*Macoun.*)

(656.) **P. Ontariensis,** C. M. & Kindb. (n. sp.)

P. intricata, Canadian Musci, No. 262, in part.

Agrees with *Pylaisia intricata* in the leaves being ovate-lanceolate-subulate-acuminate, subentire, with numerous and quadrate alar cells, the oblong-ovate capsule, the segments adhering to and bordering the lower half of the teeth, split above and cohering at the apex; differs in the branchlets being distant, not crowded, the leaves broader, shorter, acuminate with more dilated cells, the lid of the capsule obtuse, not rostellate, peristomial teeth broader, spores smaller.

On earth at the bases of trees, Ste. Anne des Monts River, Gaspé Co., Que., August 24th, 1882 ; also along Lake Nepigon. 1884. (*Macoun.*)

(657.) **P. filari-acuminata,** C. M. & Kindb. (n. sp.)

Agrees with *Pylaisia velutina* in the leaves being filiform-acuminate, but the acumen is distinctly denticulate, often twisted, the alar cells more numerous, the capsule thicker, oblong, the peristomial teeth nearly free from the segments. Lid not found.

On logs subject to inundation west side of the Columbia River at Revelstoke, B.C., May 3rd, 1890. (*Macoun.*)

(658.) **P. intricata,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 309; Canadian Musci, No. 262, in part.

Pictou Co., N.S. (*McKay.*) On trees at Fredericton, N.B. (*Fowler's Cat.*) On bases of trees, Tobique River, N.B. (*Hay.*) Decaying logs, Ste. Anne des Monts River and Grand Etang, Gaspé Co., Que.; common on trees around Ottawa; on trees at Belleville and Sudbury Junction, Ont.; common on trees at Port Dover, Lake Erie and Owen Sound, Ont.; on trees, Moose Mountain, Assiniboia; also at Lake Nepigon. (*Macoun.*) Common at London, Ont. (*J. Dearness.*)

(659.) **P. velutina,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 309; Canadian Musci, No. 470.

Heart's Delight, Newfoundland. (*Rev. A. Waghorne.*) On trees at Bass River, N.B. (*Fowler's Cat.*) On earth at the base of a tree, Mount Albert, Gaspé Co., Que.; on old logs, Dow's swamp, Ottawa; on old logs, Port Dover, Lake Erie, Ont.; on trees in the Kaministiquia Valley, Fort William, Lake Superior. (*Macoun.*)

110. HOMALOTHECIUM, Bruch & Schimp.

(660.) **H. pseudo-sericeum,** Lesq. & James, Mosses of N. America, 310; Canadian Musci, No. 435.

Abundant on rocks at Yale, B.C. (*Macoun.*)

(661.) **H. corticola,** Kindb. Bull. Torr. Bot. Club, XVII., 277.

On rocks at Cedar Hill and Mount Tolmie, near Victoria, Vancouver Island, May 16th, 1887. (*Macoun.*)

(662.) **H. sericeoides,** C. M. & Kindb. (n. sp.); Canadian Musci, No. 496.

Nearly allied to *Homalothecium sericeum*, differing in the more densely crowded, not decurrent, narrower and heteromorphous branch-leaves; some are long-acuminate, subentire, less reflexed at the margins; others are short-acuminate, strongly reflexed at the margins to the serrulate acumen. Capsules and pedicels unknown.

Crevices of granite rocks a little above Revelstoke, B.C., May 7th, 1890. (*Macoun.*)

(663.) **H. sericeum,** (Linn.) Bryol. Europ. ; Canadian Musci, No. 549.

Hypnum sericeum, Drumm. Musc. Bor.-Am., No. 169.

Stem pinnate, creeping. Branch-leaves narrow, ovate-lanceolate, short-decurrent, long-subulate or filiform-acuminate, plicate, faintly denticulate nearly all around or subentire ; margins scarcely reflexed ; cells narrow, the alar quadrate ; costa long, vanishing in the base of the acumen. Perichetial leaves scarcely plicate, attenuate to a filiform point. Capsule erect, sub-cylindric, straight or slightly curved ; teeth pale, segments short, basilar membrane high, to one-third of the segments ; cilia none ; annulus broad ; pedicel rough, 1-2 cm. long. Dicœcious.

On the bark of trees at Michosen, 16 miles from Victoria, Vancouver Island, April 16th, 1887 ; very abundant on rocks at Banff and in the " Dry Cañon" at Devil's Lake, Rocky Mountains. (*Macoun.*) Rocks among the Rocky Mountains. (*Drummond.*)

III. ENTODON, C. Mueller.

(664.) **E. acicularis,** C. M. & Kindb. (n. sp.)

Tufts compact, brown-yellow or variegate with green. Stem much divided, very radiculose; branches very short and turgid, not attenuate. Leaves imbricate, with difficulty loosed from the stem, scarcely open when moist, finally golden-yellow, from the ovate-oblong base suddenly narrowed to a fine aciculiform or subulate point, denticulate nearly all around ; cells not chlorophyllose, linear-lanceolate or fusiform, the alar not well defined ; costa generally wanting. Barren.

On rocks in McKay's woods, near the lake, at Ottawa, May 2nd, 1885 ; also by an old lime-kiln at Brittania, six miles west of Ottawa, October, 1890. (*Macoun.*)

(665.) **E. cladorrhizans,** (Hedw.) C. Muell.

Neckera cladorrhizans, Drumm. Musc. Bor.-Am., No. 160, in part.
Cylindrothecium cladorrhizans, Schimp. ; Lesq. & James, Mosses of N. America, 311 ; Canadian Musci, No. 263.

Entodon (*Cylindrothecium*) *cladorrhizans* Hedw., differing from the European *E. Schleicheri* (Schimp.) in the broad annulus of the capsule which is very imperfectly described by Lesq. & James (page 311.) It merits therefore a more complete description of the plant.

Tufts dense but loosely cohering. Stem pinnate ; branchlets alternate. Leaves ovate-oblong, obtusate with a very short, often recurved point, subentire or slightly denticulate above, often faintly striate ;

margins recurved at the angles; cells not distinctly chlorophyllose, narrow, fusiform-lanceolate or sub-linear, also the inner basal; alar cells numerous, well-defined and quadrate; costa none or short and double. Perichetial leaves long subulate-acuminate, faintly denticulate at the acumen. Monœcious.

On logs, Tay, York Co., N.B. (*J. Moser.*) On old logs in McKay's woods at Ottawa; very abundant on old logs at Carleton Place, 30 miles west of Ottawa; on stones at Britannia, six miles west of Ottawa; common on old logs at Belleville, Leamington and Owen Sound, Ont. (*Macoun.*) Trunks of trees, Upper Canada (Ontario). (*Drummond.*) Common on old logs at London, Ont. (*J. Dearness*)

(667.) **E. Macounii,** C. M. & Kindb. (n. sp.)

Cylindrothecium Drummondii, Canadian Musci, No. 436.

Tufts loose. Stem sparingly divided, translucent (visible, in a dry state, through the leaves); branches much compressed, elongate, not attenuate, shining green above. Leaves patent, concave, short, ovate-lanceolate, attenuate to a short subulate point; basal angles rounded; margins scarcely recurved below, faintly denticulate all around; cells faintly chlorophyllose, long-sublinear, the lowest basal dilated, oblong or the alar often subquadrate; costa none or very short and double. Perichetial leaves small, convolute or connivent, longer acuminate, more distinctly denticulate at the apex. Dicœcious.

The species is quite distinct; *Entodon Drummondii* differs in the leaves being obtusate, nearly entire, &c.

On earth in the "Big Swamp," Murray, Northumberland Co., Ont., October 7th, 1888. (*Macoun.*)

(668.) **E. (Raphidostegium ?) expallens,** C. M. & Kindb. (n. sp.)

Tufts loose, pale yellow. Stems sparingly divided, radiculose at the base. Branches elongate, much compressed, not attenuate. Leaves sub-distichous, patent, short ovate-lanceolate, acute, concave, nearly entire, denticulate only at the apex, distinctly auriculate, not recurved at the margins; cells not chlorophyllose, long-sublinear, the inner basal dilated sub-oblong; auricles excavate, well-defined with large, oval or roundish, finally golden-yellow cells; costa none or double, sometimes reaching to the middle. Barren.

This species could perhaps be related to the genus *Raphidostegium,* but the leaves are not recurved at the margins; the plant is more robust and resembles *Entodon Macounii* in habit.

In boggy soil in wet woods at Stephen, summit of Rocky Mountains, July 23rd, 1885. (*Macoun.*)

(669.) **E. seductrix,** (Hedw.) C. Muell.

Cylindrothecium seductrix, Sulliv. ; Lesq. & James, Mosses of N. America, 311.

Neckera cladorhizans, Drumm. Musc. Bor.-Am., No. 160, in part.

On rotten logs, in woods, at Sudbury Junction, Ont. ; on old logs at the mouth of Sturgeon Creek, Leamington, Lake Erie, Ont. (*Macoun.*) On trunks of trees, Upper Canada (Ontario). (*Drummond.*)

(670.) **E. brevisetum,** (Hook. & Wils.)

Cylindrothecium brevisetum, Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 312.

On old logs and rocks, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Doubtful specimens from New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

(671.) **E. compressum,** (Hedw.) C. Muell.

Cylindrothecium compressum, Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 311.

On roots of trees on James Terrill's Farm close to Cold Creek, Brighton, Northumberland Co., Ont. (*Macoun.*)

112. CLIMACIUM, Web. & Mohr.

(672.) **C. dendroides,** Web. & Mohr ; Lesq. & James, Mosses of N. America, 314 ; Canadian Musci, No. 264 ; Drumm. Musc. Bor.-Am., No. 230.

About Beaver Lake and the Columbia River. (*Drummond.*) White Bay, Newfoundland. (*Rev. A. Waghorne.*) Miquelon Island. (*Delàmare.*) Island of Orleans, Que. (*St. Cyr.*) On the ground in dense shade, Molus River, N.B. (*Fowler's Cat.*) On earth, Brackley Point, Prince Edward Island ; on rocks along Gull River, Victoria Co., Ont. ; also in wet woods west of Hull, Que. ; on rocks along the shore of Lake Huron and Lake Nepigon, Ont. ; in damp woods at Revelstoke, Columbia River, also at Agassiz, Hastings and Quesnel, B.C. (*Macoun.*) Salmon Arm, Shuswap Lake, B.C. (*Law.*) Not rare in Greenland. (*Fl. Gr.*)

(673.) **C. Americanum,** Brid. ; Lesq. & James, Mosses of N. America, 314 ; Canadian Musci, No. 265 ; Drumm. Musc. Bor.-Am., No. 231.

Upper Canada (Ontario). (*Drummond.*) Pictou Co., N.S. (*McKay.*) Placentia Bay, Newfoundland. (*Rev. A. Waghorne.*) Wet places, Bass

River, N.B. (*Fowler's Cat.*) In boggy woods, Canaan Forks, N.B. (*J. Moser.*) Shaded places, River Rouge, Argenteuil Co., Que. (*D'Urban.*) On earth in swamps at Ottawa, common; along the River Ste. Anne des Monts, Gaspé Co., Que.; abundant in swamps at Belleville and Leamington, Ont.; in swamps at Banff, Rocky Mountains. (*Macoun.*) Fine and common at London, Ont. (*J. Dearness.*)

(674.) **C. Ruthenicum,** (Weinm.) Lindb.; Lesq. & James, Mosses of N. America, 314.

Sitka. (*Bischoff.*) At Sitka, Alaska and on Attu Island, Behring Sea, 1891. (*J. M. Macoun.*)

113. ORTHOTHECIUM, Bruch & Schimp.

(675.) **O. rufescens,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 315.

Wet rocks, Davis Strait. (*Taylor* fide *Lesq. & James.*)

(676.) **O. rubellum,** (Mitt.) Kindb.; Lesq. & James, Mosses of N. America, 315.

Davis Straits. (*Taylor.*) Rocky Mountains, intermixed with *Catoscopium nigritum.* (*Drummond* fide *Mitten.*)

(677.) **O. intricatum,** Hartm.

On rocks around Kicking Horse Lake, Rocky Mountains. (*Macoun.*) Greenland. (*Fl. Gr.*)

(678.) **O. chryseum,** Bruch & Schimp.; Lesq. & James, Mosses of N. America, 316; Canadian Musci, No. 266.

Hypnum rufescens, Drumm. Musc. Bor.-Am., No. 221.

Moist rocks amongst the rocky Mountains. (*Drummond.*) Rocky Mountains. (*Bourgeau.*) Beechey Island, Wellington Channel and Pond's Bay, Arctic America. (*Mitten.*) In boggy places and on wet rocks at Hector, Banff, Lake Louise, and "Dry Cañon," discharge of Devil's Lake, Rocky Mountains. (*Macoun.*) Greenland. (*Fl. Gr.*)

XXV. HYPNEÆ.

114. PSEUDOLESKEA, Bruch & Schimp.

(679.) **P. atrovirens,** Dicks.; Lesq. & James, Mosses of N. America, 319; Canadian Musci, No. 437.

Cape Chudleigh, Hudson Strait. (*R. Bell.*) On rocks at Niagara Falls and Lake Superior; on damp rocks three miles below Hector, Rocky Mountains; on damp rocks, Roger's Pass, Selkirk Mountains; on rocks, mountains north of Griffin Lake, B.C., alt. 6,700 feet; also on rocks at Yale, B.C. (*Macoun.*) On rocks, Lake Huron. (*Mrs. Roy.*) Greenland. (*Fl. Gr.*)

Var. **atricha,** Kindb. (n. var.)

Differs principally in the tufts being very dense and soft-fuscescent with green tips, stem very lax, nearly without paraphyllia and rhizoids.

On rocks along the Eagle River, just below the bridge at Griffin Lake, B.C., August 13th, 1889. (*Macoun.*)

(680.) **P. oligoclada,** Kindb. Bull. Torr. Bot. Club, XVII., 277.

Allied to *Pseudoleskea atrovirens*, but very different in smaller leaf-cells. Tufts loose, dark brown, sparingly radiculose. Secondary stems sparingly branched; branchlets distant, short and julaceous, paraphyllia numerous. Leaves crowded, not decurrent, appressed when dry, falcate when moist, reflexed on the borders generally to the middle, abruptly attenuate from the short ovate base to the longer, sub-entire acumen, not striate; cells very small, faintly papillose, not confluent, short with incrassate walls, rotundate or quadrate, only the upper-most narrow; costa brown, stout, vanishing into the acumen; perichetial leaves longer, acuminate, scarcely reflexed on the borders; cells narrower; archegonia 10–12, paraphyses few, shorter. Dicœcious. Capsules and male plants unknown.

On damp rocks, Mount Benson, Nanaimo, Vancouver Island, June 8th, 1887. (*Macoun.*)

M. Cardot believes that this plant is a variety of *Pseudoleskea atrovirens.*

(681.) **P. sciuroides,** Kindb. Bull. Torr. Bot. Club, XVII., 276.

Macounia sciuroides, Kindb. enumer. bryin. exot., 1888.

Plants loosely cohering. Stems sparingly branching, more or less radicant; paraphyllia numerous; branches pale-green, curved above.

Leaves crowded, sub-entire, not, or indistinctly, papillose, not decurrent, from the ovate base narrowed into a shorter, subulate or piliform acumen, falcate also in a dry state, more or less plicate, revolute nearly all around, margins broader below; cells hyaline, only the lowest basal yellow, all thin-walled, the inner and upper oblong or lanceolate, the other subquadrate; costa stout, finally yellowish, vanishing in or below the acumen. Perichetial leaves from the base more attenuate, denticulate at the acumen, nerveless or indistinctly costate. Capsule oblong, sub-erect or inclined, not striate; peristome orange-colored; teeth densely articulate without distinct longitudinal lines, subulate, hyaline-bordered, when dry incurved; segments scarcely shorter or narrower, in the middle pertuse; basilar membrane very short; cilia smooth; pedicel 1.5 cm. long; spores large, 0.02 mm. Lid and calyptra unknown. Dicœcious.

On rocks in the valley of Elk River, Rocky Mountains, 1883. (*Dawson.*)

Var. **denudata,** Kindb. (n. var.); Canadian Musci, No. 564.

Stems more rigid, about 10 cm. long, nearly simple, curved only at apex, naked below and not radicant. Barren.

This variety differs very much in its habit; it is possible, that the capsule, not hitherto found, also is different so as to form a new species.

On rocks along the Asulcan Creek near the glacier of that name, Selkirk Mountains, B.C., alt. 6,000 feet, August 7th, 1890. (*Macoun.*)

(682.) **P. stenophylla,** Ren. & Card. Coult. Bot. Gaz.; Canadian Musci, No. 580.

Quite common on stems of alder and on stones on damp mountain slopes in Roger's Pass, Selkirk Mountains, August 5th, 1890. (*Macoun.*)

(683.) **P. radicosa,** Mitt.; Lesq. & James, Mosses of N. America, 320.

Hypnum tenax, Drumm. Musc. Bor.-Am., No. 225, in part.

Banks of Portage River, Rocky Mountains. (*Drummond.*)

(684.) **P. rigescens,** Lindb. Act. Soc. Fenn. X. 247.

P. radicosa, var. *gracilis,* Lesq. & James, Mosses of N. America, 320.
Hypnum tenax, Drumm. Musc. Bor.-Am., No. 225, in part.

Banks of Portage River, Rocky Mountains. (*Drummond.*)

(685.) **P. falcicuspis,** C. M. & Kindb. (n. sp.) ; Canadian Musci, No. 510.

Plants densely tufted. Stems much branching. Leaves very papillose, denticulate above, short, ovate-lanceolate, attenuate to an acute or filiform, often curved, point, long-decurrent ; margins recurved to or above the middle, not in the upper part ; cells rotundate, at the angles quadrate ; costa vanishing far below the acumen. Dicœcious.

Differs from *Pseudoleskea atrovirens* principally in the long-decurrent, very distinctly papillose and more denticulate leaves.

On rocks, west side of Lake Mara, Sicamous, B.C., July 3rd, 1889 ; on rocks at the Illicillewaet Cañon, near Revelstoke, also at Quesnel, B.C. (*Macoun.*)

(686.) **P. malacoclada,** C. M. & Kindb. (n. sp.)

P. catenulata, Canadian Musci, No. 460.

Plants densely tufted. Stems not rigid, much branching, sparingly radicant without paraphyllia ; branches green or finally fuscescent. Leaves crowded, entire, not decurrent, not distinctly papillose ; the stem-leaves from a concave, broadly ovate or rotundate base suddenly narrowed to the subulate or filiform, recurved acumen ; branch-leaves more attenuate to the subulate and patent point ; basal margins recurved ; cells rotundate, the alar quadrate ; costa very short and double or none. Perichetial leaves closely connivent with a patent or curved acumen ; cells sublinear-lanceolate. Dicœcious.

This species resembles *Leskea nervosa* in habit, but is very different in its nerveless leaves ; it is rather allied to the European *Pseudoleskea catenulata,* but is more robust.

On dry rocks in the ravine west of Murray's Ranche, Spence's Bridge, B.C., May 25th, 1889. (*Macoun.*)

115. HETEROCLADIUM, Bruch & Schimp.

(687.) **H. dimorphum,** Brid. ; Lesq. & James, Mosses of N. America, 321.

Nova Scotia. (*James.*) On rocks, Canaan Forks, Queen's Co., and at Tay, York Co., N.B. (*J. Moser.*) Greenland. (*Fl. Gr.*)

(688.) **H. heteropterum,** Bruch. ; Canadian Musci, No. 267.

Hypnum catenulatum, Drumm. Musc. Bor.-Am., No. 219.

On damp rocks at Hastings, Burrard Inlet, B.C. ; damp rocks, Goldstream and Nanaimo, Vancouver Island. (*Macoun.*) Forward Inlet,

Gulf of Georgia, B.C. (*Dawson.*) Greenland. (*Fl. Gr.*) Upon rocks, rare; not found in fructification. (*Drummond.*)

(689.) **H. Vancouveriense,** Kindb.

Thuidium Vancouveriense, Kindb., Bull. Torr. Bot. Club, XVII., 277.

Plants minute, densely and irregularly pinnate, sparingly radiculose, rarely flagelliferous, dark green, not glossy; branches short, very slender. Leaves ovate-deltoid, denticulate above the middle, pellucid, faintly papillose; stem-leaves decurrent, reflexed at the base, acute; branch-leaves smaller, looser, more concave, oval and obtuse; cells hexagonal-oval or rhombic, the alar and marginal quadrate-rhombic; costa slender, short, scarcely reaching to the middle; paraphyllia few or none. Perichetial leaves longer acuminate, cells narrower. Capsule small, oblong, sub-erect; peristome perfect; teeth yellowish; cilia 2; elongate; pedicel 1 cm. long. Dicœcious.

On rocks on the upper slopes of Mount Finlayson, at Goldstream; also on Mount Arrowsmith, Vancouver Island, July 17th, 1887. (*Macoun.*)

(690.) **H. procurrens,** Lesq. & James, Mosses of N. America, 321; Canadian Musci, No. 498.

British North America. (*Drummond* fide *Mitten.*) On damp rocks, Roger's Pass, Selkirk Mountains, B.C., alt. 4,500 feet; on rocks near Hector, Rocky Mountains. (*Macoun.*)

(691.) **H. frullaniopsis,** C. M. & Kindb. (n. sp.)

Stem irregularly divided, brown-red, not radiculose; branches short, obtuse, when dry incurved; paraphyllia none. Leaves uniform, dark green, not shining, when dry loosely, or not at all, appressed, subsquarrose when moist, distant and decurrent, cochleariform, roundish oval, obtusate, incurved at the apex, minutely denticulate above to the middle, very papillose; upper cells rhombic, the lower oblong, the alar quadrate, the inner basal reddish; costa short, more or less distinct sometimes stout and simple. Dicœcious. Habit of the hepatic, *Frullania*

This species differs very much from the allied species principally in the uniform leaves, the absence of paraphyllia and the not cordate leaf-base.

On trees, at Canaan Forks, Queen's Co., N.B. (*J. Moser.*)

(692.) **H. aberrans,** Ren. & Card. Coult. Bot. Gaz.

H. homœopterum, C. M. & Kindb.; Canadian Musci, No. 484.

Abundant on rocks and bark of trees around Revelstoke, also at

Pass Creek Falls, near Sproat, Columbia River, B.C., May 5th, 1890. (*Macoun.*)

116. THUIDIUM, Schimp.

(693.) **T. minutulum,** Bruch & Schimp., Bryol. Europ.; Canadian Musci, No. 268, in part.

Hypnum minutulum, Hedw.; Lesq. & James, Mosses of N. America, 322.

Bass River, N.B. (*Fowler's Cat.*) On old logs and rocks in McKay's woods at Ottawa; on old logs at Belleville and North Hastings, Ont.; on limestone rocks at Wooler and Owen Sound, Ont. (*Macoun.*)

(694.) **T. scitum,** Aust. Musc. Appal., No. 300; Canadian Musci, No. 269 and No. 268 in part.

Hypnum abietinum var. *minor*, Drumm. Musc. Bor.-Am., No. 217.
H. scitum, Beauv.; Lesq. & James, Mosses of N. America, 323.

On trees at Fredericton, N.B. (*Fowler's Cat.*) On beech trees in McKay's woods at Ottawa; quite common on beech trees around Belleville, Brighton, Wooler and Owen Sound, Ont. (*Macoun.*) On stones and trunks of trees, Ontario. (*Drummond.*)

Var. **lonchoneuron,** Kindb. n. var. (n. sp. ?)

Differs in the stems being irregularly divided, sparingly radiculose, the branchlets thick, the stem-leaves more broadly revolute at the borders below the acumen, less papillose, the costa stout, percurrent or excurrent, the branch-leaves quite acute (in *T. scitum* subobtuse). Capsules not found. Differs from *T. gracile* in the entire leaves.

On old logs at the mouth of Sturgeon Creek, near Leamington, Ont., September 23rd, 1890. (*Macoun.*)

(695.) **T. gracile,** Bruch & Schimp.; Canadian Musci, No. 270.

Hypnum gracile, Bruch & Schimp.; Lesq. & James, Mosses of N. America, 324.

On rotten logs at Fredericton, N.B. (*Fowler's Cat.*) Abundant on rotten logs in woods at Leamy's Lake, near Ottawa; also on old logs at Belleville and Brighton, Ont. (*Macoun.*) Saskatchewan. (*Bourgeau.*)

Var. **Lancastriense,** Sulliv. & Lesq.

On earth in woods, five miles west of Belleville, Ont.; also on stones in woods at Port Dover, Ont. (*Macoun.*)

(696.) **T. lignicola,** Kindb. Ott. Nat. IV. p.

Monœcious. Tufts yellowish or bright green. Stems simply pinnate with few rhizoids and short, scarcely ramose paraphyllia; branches close, distichous, attenuate, flexuous or slightly recurved. Stem-leaves from the broad, cordate base attenuate to a long, often curved, point, faintly striate, reflexed on the borders; branch-leaves shorter, acuminate; all denticulate from the middle upward and papillose at the back or on both sides; cells obscure and rounded; costa vanishing in or below the apex. Capsule cylindrical, arcuate and light brown; teeth pale; cilia long, perfect; annulus double; lid conical, short-apiculate. Differs from *T. Blandowii* in the shorter areolation of the leaf-cells, the smaller capsule, the shorter paraphyllia and the generally shorter, 1 cm. long, pedicel.

On rotten logs at Port Dover, Ont.; on rotten logs along the base of the Porcupine Mountain, Man.; on old logs at Quesnel, B.C. (*Macoun.*)

(697.) **T. recognitum,** (Hedw.) Lindb.; Canadian Musci, No. 271.

Hypnum recognitum, Hedw.; Lesq. & James, Mosses of N. America, 325.
H. proliferum var. *compactum,* Drumm. Musc. Bor.-Am., No. 214.

Abundant in shady woods. (*Drummond.*) On rotten wood, Broad Cove, Labrador. (*Rev. A. Waghorne.*) On earth at the bases of trees in woods, Bass River, N.B. (*Fowler's Cat.*) At Truro, N.S.; wet woods, Brackley Point and Tignish, Prince Edward Island; damp woods near Ottawa; also in woods at Belleville and Owen Sound, Ont.; damp woods near Donald, Columbia Valley; at Revelstoke and on earth at Pass Creek, near Sproat, Columbia River; on earth at Sicamous and abundant at Quesnel, B.C., and west of the Fraser River at that point. (*Macoun.*) Common at London, Ont. (*J. Dearness.*) Greenland. (*Fl. Gr.*)

(698.) **T. delicatulum,** (Linn.) Mitt. Journ. Linn. Soc. XII. 578; Canadian Musci, No. 272.

Hypnum delicatulum, Linn.; Lesq. & James, Mosses of N. America, 325.
H. proliferum, Drumm. Musc. Bor.-Am. No. 213.

Shady woods; but not common. (*Drummond.*) Miquelon Island. (*Delàmare.*) Broad Cove, Newfoundland; Little Bay Islands, Labrador. (*Rev. A. Waghorne.*) Pictou Co., N.S. (*McKay.*) On the ground at Bass River, N.B. (*Fowler's Cat.*) On earth in swamps at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) In Dow's swamp near Ottawa; quite common in cedar swamps at Belleville, Ont.; in a swamp at

Sturgeon Creek, Leamington, Ont. (*Macoun.*) Common at London, Ont. (*J. Dearness.*) Saskatchewan. (*Bourgeau.*)

(699.) **T. abietinum,** Bruch & Schimp.; Canadian Musci, No. 273.

Hypnum abietinum, Linn.; Lesq. & James, Mosses of N. America, 326; Drumm. Musc. Bor.-Am., No. 216.

Upon rocks in dry sandy soil; common. (*Drummond.*) On rocks, White Bay, Newfoundland. (*Rev. A. Waghorne.*) On rocks and ground, Restigouche, N.B. (*Fowler's Cat.*) Shaded rocks, Jupiter River, Anticosti; on rocks, Pirate's Cove, Straits of Canso, N.S.; on exposed rocks, McKay's woods, Ottawa; limestone rocks along the Moira at Belleville, Ont.; on rocks along Lake Nepigon, Ont.; dry rocks along Peace River, lat. 56°; also along the Bow River at Morley and Banff, and on rocks, "Dry Cañon," discharge of Devil's Lake, Rocky Mountains; dry rocks at Quesnel, B.C. (*Macoun.*) On dry rocks, Buffalo Lake, N.W.T. (*J. M. Macoun.*) Lake Winnipeg. (*Bourgeau.*) Greenland. (*Fl. Gr.*)

(700.) **T. Blandowii,** Bruch & Schimp.; Canadian Musci, No. 274.

Hypnum Blandowii, Web. & Mohr; Lesq. & James, Mosses of N. America, 326; Drumm. Musc. Bor.-Am., No. 215.

Miquelon Island. (*Delamare.*) In marshes; abundant. (*Drummond.*) In bogs, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Peat swamp, Tignish, Prince Edward Island; in bogs, Salt Lake, Anticosti; peat swamp at Truro, N.S.; in Dow's swamp and at Brittania near Ottawa; also abundant in peat bogs in Hastings and Northumberland counties, Ont.; swamps at Morley and Stephen, Rocky Mountains; peat swamps, Telegraph Trail, west of Fraser River, B.C. (*Macoun.*) Greenland. (*Fl. Gr.*)

(701.) **T. Whippleanum,** (Sulliv.) Kindb.

T. leskeoides, Kindb. Bull. Torr. Bot. Club, XVII., 277.
Hypnum (*Claopodium*) *Whippleanum,* Sulliv.; Lesq. & James, Mosses of N. America, 328.

On rocks at Cedar Hill, near Victoria, and at the railway bridge over the Nanaimo River, near Nanaimo, Vancouver Island. (*Macoun.*)

(702.) **T. crispifolium,** (Hook.) Kindb.

Hypnum (*Claopodium*) *crispifolium,* Hook.; Lesq. & James, Mosses of N. America, 329; Canadian Musci, Nos. 275 and 276.

British Columbia. (*Lyall.*) Vancouver Island. (*Wood.*) On rocks

at Revelstoke, and the mouth of Pass Creek, Columbia River; on rocks at Griffin Lake, Sicamous, Yale, Agassiz and Hastings, B.C.; quite common on Vancouver Island at Victoria, Nanaimo and Comox. (*Macoun.*) On rocks, Melaspina Inlet, B.C. (*Dawson.*) North-western Alaska. (*Roth. Alask.*) Kodiak Island, Alaska, 1891. (*J. M. Macoun.*)

(703.) **T. laxifolium,** (Hook.)

Hypnum (*Claopodium*) *laxifolium*, Schwaegr; Lesq. & James, Mosses of N. America, 329.

North-west coast of America. (*Menzies.*) North-western Alaska. (*Roth. Alask.*)

117. TRIPTEROCLADIUM, (C. Mueller.)

(704.) **T. rupestre,** Kindb.

Platygyrium (*?*) *rupestre*, Kindb. Bull. Torr. Bot. Club, XVII., 276; Canadian Musci, No. 469.

Plants intricate, cæspitose, pale brownish-green, not glossy. Stems irregularly divided, branchlets short, filiform, not creeping. Leaves small, densely crowded, when dry appressed, open-erect when moistened, scarious and pellucid, not chlorophyllose nor papillose, subovate, acute or long-acuminate, the upper denticulate above, the borders recurved below, sometimes to the middle or above it; areolation in the lower leaves sub-linear above, looser at the base, in the upper leaves looser, oblong-linear, in all subquadrate at the borders and at the base; costa none.

This species is probably monœcious, but the male flowers are not distinctly evolute. Differs from the related *Tripterocladium leucocladulum*, C. Muell. (not correctly described by Lesq. & James), of which I possess original specimens, (given by the author, Dr. C. Mueller,) in the leaves being revolute at the borders to the middle, nearly entire or indistinctly denticulate, also in the narrower areolation and the outer perichetial leaves being blunt, the inner erect, not reflexed at the apex. (*Kindberg.*)

On the face of a cliff above the first tunnel at Yale, B.C., May 17th 1889. (*Macoun.*)

118. CAMPTOTHECIUM, Schimp.

(705.) **C. lutescens,** Bruch & Schimp., Bryol. Europ.

Hypnum (*Camptothecium*) *lutescens*, Hedw. ; Lesq. & James, Mosses of N. America, 331.

About the roots of trees. (*Drummond.*) Alaska. (*Kellogg.*) Vancouver Island. (*Lyall.*) On roots of trees at Yale and Quesnel, B.C. (*Macoun.*) Kotzebue Sound and Alaska. (*Roth. Alask.*) Greenland. (*Fl. Gr.*)

(706.) **C. fulgescens,** Mitt., Bot. Zeit. XVI., 1858. 170.

On the bases of stumps along the railway a little east of Hastings, Burrard Inlet, B.C. ; also on stones in Roger's Pass, Selkirk Mountains. (*Macoun.*)

(707.) **C. æneum,** (Mitt.)

Hypnum æneum, Mitt. ; Lesq. & James, Mosses of N. America, 331.

Pend d'Oreille River, British Columbia. (*Lyall.*) On rocks at Mount Tolmie, near Victoria ; on logs at Cedar Hill, and on logs at Comox, Vancouver Island ; on the bases of trees at Agassiz, B.C. (*Macoun.*)

(708.) **C. Amesiæ,** Ren. & Card., Coult. Bot. Gaz. XIII., 202.

On rocks at Sicamous, B.C., July 3rd, 1889 ; abundant on trees at Victoria, Vancouver Island. (*Macoun.*)

(709.) **C. Nuttallii,** (Wils.) Bruch & Schimp., Bryol. Europ.

Hypnum (*Camptothecium*) *Nuttallii*, Wils. ; Lesq. & James, Mosses of N. America, 332.
H. pinnatifidum, Canadian Musci, No. 280.

On trees, old logs and rocks around Victoria, Vancouver Island. (*Macoun.*) Vancouver Island. (*Lyall.*)

(710.) **C. Nevadense,** (Lesq.)

Hypnum Nevadense, Lesq. ; Lesq. & James, Mosses of N. America, 332.
Homalothecium pseudo-sericeum, Canadian Musci, No. 435.

On rocks at Agassiz, B.C., May 8th, 1890 ; on rocks at Lytton, Yale and Hastings, B.C. ; and at Victoria, Vancouver Island. (*Macoun.*)

(711.) **C. hamatidens,** Kindb.

Hypnum (*Camptothecium*) *hamatidens*, Kindb., Bull. Torr. Bot. Club, XVI., 97 ; Canadian Musci, No. 279.

Dicœcious. Densely cæspitose, yellow or green, glossy. Stems prostrate, scarcely or not radiculose, irregularly pinnate-ramose; branchlets short, attenuate and flexuose. Leaves open-erect, lanceolate, long filiform-acuminate, striate, hooked-denticulate or spinulose all around, reflexed on the borders ; cells narrow, the basilar small and short ; costa stout, vanishing at the apex. Perichetial leaves nerveless, narrowed into an erect, or flexuose, subulate point, entire or slightly denticulate. Capsule cylindric-oblong, curved, suberect or inclined, without a neck ; segments split their whole length or coherent at the apex ; cilia rudimentary ; annulus narrow ; lid conic-obtuse, depressed in the middle and mammillate ; pedicel 1–1.5 cm. long, rough the whole length. Related to *H. Nuttallii*, Wils., but differs as above.

On rocks at Yale and Agassiz, B.C. ; on trees at Mount Tolmie, near Victoria, Vancouver Island ; (also at Nanaimo, June 8th, 1887.) ? (*Macoun.*)

Var. **tenue,** Kindb., Bull. Torr. Bot. Club, XVII., 277 ; Canadian Musci, No. 392.

Branches longer, filiform, leaves smaller only at the base and hooked-denticulate at the apex.

On perpendicular rocks, Mount Erskine, Salt Spring Island, Gulf of Georgia, B.C., May 10th, 1887. (*Macoun.*)

(712.) **C. nitens,** Schimp. Syn., 530.

Hypnum (*Camptothecium*) *nitens*, Schreb. ; Lesq. & James, Mosses of N. America, 333 ; Canadian Musci, No. 278 ; Drumm. Musc. Bor.-Am., No. 172.

In swamps ; not common. (*Drummond.*) Mansfield Island, Hudson Straits. (*R. Bell.*) Peat bogs, Salt Lake, Anticosti ; Dow's swamp and Mer Bleue, near Ottawa ; peat swamps in Hastings and Northumberland counties, Ont. ; peat bog, Lake Nepigon, Ont. ; on wet limestone rocks, Hudson Hope, Peace River, lat. 56° ; swamps at Morley, Banff, Stephen and Hector, Rocky Mountains ; peat swamp west of the Fraser River at Quesnel, B.C. (*Macoun.*) Peat bogs, Port Arthur, Ont. (*Mrs. E. G. Britton.*) In bogs, Portage la Loche, N.W.T. (*J. M. Macoun.*) Kotzebue Sound. (*Roth. Alask.*) Greenland. (*Fl. Gr.*) Bogs, Saskatchewan. (*Bourgeau.*) In swamps near London, Ont. (*J. Dearness.*)

(713.) **C. aureum,** (Lag.) Schimp.

On rotten logs at Cedar Hill, near Victoria, Vancouver Island, April 16th, 1887. (*Macoun.*) Also found near Victoria by Dr. Rœll.

119. BRACHYTHECIUM, Schimp.

(714.) **B. lætum,** (Brid.)

Hypnum (*Brachythecium*) *lætum,* Brid. ; Lesq. & James, Mosses of N America, 335 ; Canadian Musci, No. 281.
Hypnum salebrosum, Drumm. Musc. Bor.-Am., No. 175, in part.

New Harbor, Newfoundland, and at Battle Harbor, Labrador. (*Rev. A. Waghorne.*) Bass River, N.B. (*Fowler's Cat.*) On stones in woods, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Pictou Co., N.S. (*McKay.*) Baie St. Paul, Charlevoix Co., Que. (*St. Cyr.*) Stones in woods, Gunn River, Anticosti ; on stones in woods at Truro, N.S. ; old logs, Gaspé Co., Que. ; on stones in woods around Ottawa ; on stones in woods at Belleville, Trenton, Wooler, Owen Sound and London, Ont. (*Macoun.*) In woods, London, Ont. (*J. Dearness.*) In marshy ground ; rare. (*Drummond.*)

Obs. *Brachythecium lætum,* only found in America, has also a monœcious inflorescence (not " dicœcious," Lesq. & James) ; the European *Brachythecium luteolum,* C. Mueller, is indeed dicœcious.

(715.) **B. digastrum,** C. M. & Kindb. (n. sp.)

Tufts laxly cohering, olive-green, not shining. Stem rigid, subpinnate or irregularly branching, radiculose below ; branches subjulaceous, obtusate. Stem-leaves when dry loosely appressed or subimbricate, crowded, patent or subsecund when moist, decurrent, not auricled, plicate, bi-ventrose, ovate and short-acuminate with the acumen flexuous or when dry serpentino-corrugate, borders more or less recurved but not reflexed, subentire or faintly denticulate above ; lower basal cells wide and sub-rhombic, the alar rather quadrate-rectangular and not very distinct, the upper conflate, small, very chlorophyllose, the inner median sublinear, the other oblong-lanceolate ; costa thick and subflexuous, long and vanishing near the acumen. Branch-leaves ovate-oblong, more distinctly revolute at the borders, denticulate at the acumen and narrower areolate. Female flowers small, inner perichetial leaves filiform-acuminate with the acumen arcuate, long-costate and denticulate. Capsule asymmetric, subcylindric, curved ; lid long-conic ; pedicel smooth, 1–2 cm. long. Peristomial teeth conic-connivent when moist, dark red-brown below,

very much longer than those in the middle open segments; cilia nodulose, not appendiculate, annulus none. Monœcious. Habit of *Leucodon julaceous*.

The species is (*fide* C. Mueller) allied to *Brachythecium* (*Cavernularia*) *biventrosum*, C.M., but more robust. It agrees also with *B. lætum*, (Brid.) not found in Europe; it has long-acuminate, soft and shining, and when dry, patent leaves. The European *B. luteolum*, C. M., (*B. lætum*, Schimp., non Brid.) is also different from the true *B. lætum*, which is neither completely nor correctly described by Lesq. & James, principally in the diœcious inflorescence.

On rocks in McKay's bush, Ottawa, Ont., October 12th, 1889. (*Macoun.*) On rocks, Canaan Forks, Queen's Co., N.B., 1889. (*J. Moser.*)

(716.) **B. spurio-acuminatum,** C. M. & Kindb. (n. sp.); Canadian Musci, No. 566.

Differs from *Brachythecium acuminatum* in the tufts being lax, loosely adhering at the substrate, the leaves denticulate and recurved at the borders nearly all around, the alar cells still more numerous and very chlorophyllose, the perichetial leaves subulate-acuminate, not filiform-pointed, the inflorescence monœcious.

On logs in woods, Brighton, Northumberland Co., Ont., October 6th, 1888; also on logs at Leamington, Lake Erie, Ont.. 1890. (*Macoun.*)

(717.) **B. acuminatum,** (Beauv.)

Hypnum (*Brachythecium*) *acuminatum*, Beauv.; Lesq. & James, Mosses of N. America, 336; Canadian Musci, No. 282.
H. pulchrum, Drumm. Musc. Bor.-Am., No. 180, in part.
H. erectum, Drumm. Musc. Bor.-Am., No. 224.

Pictou Co., N.S. (*McKay.*) Bases of trees, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On earth in McKay's woods, Ottawa; at Carleton Place, 30 miles west of Ottawa; on leaning trees at Wooler; on earth and logs in woods at Belleville, Ont.; on the bases of trees, Moose Mountain, Assiniboia. (*Macoun.*) In woods, London, Ont. (*J. Dearness.*) Upon trunks of trees in Upper Canada (No. 180) (Ontario); roots of trees in Upper Canada (No. 224.) (*Drummond.*)

* **B. cyrtophyllum,** Kindb. (n. subsp.)

Brachythecium cyrtophyllum, Kindb. Ott. Nat. IV., 63.

Habit of a small form of *B. albicans*. Plants cæspitose, green and faintly glossy. Stems irregularly divided, not creeping; branchlets filiform, sub-obtuse. Leaves small, close, loosely appressed when dry, open-erect when moistened, ovate-acute or short-acuminate, not sulcate

or decurrent, serrulate at least above the middle; areolation loose; upper cells narrowly rhomboidal, inner sublinear; alar quadrate, somewhat numerous, chlorophyllose; costa stout, reaching to $\frac{2}{3}$. Perigonial leaves ecostate. Dicœcious.

On elm logs in thick woods, Brighton, Northumberland Co., Ont., October 6th, 1888. (*Macoun.*)

Var. **setosum,** Sulliv. & Lesq.

In holes in maple trees many feet above the ground at Belleville, Ont.. (*Macoun.*)

(718.) **B. salebrosum,** Bruch & Schimp., Bryol. Europ.

Hypnum (*Brachythecium*) *salebrosum,* Hoffm.; Lesq. & James, Mosses of N. America, 336; Canadian Musci, No. 283; Drumm. Musc, Bor.-Am., No. 175.

Pictou Co., N.S. (*McKay.*) Norman's Cove and New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Bass River and Fredericton, N.B. (*Fowler's Cat.*) On earth, Tobique River and St. John, N.B. (*Hay.*) On earth at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Baie St. Paul, Charlevoix Co., Que. (*St. Cyr.*) Moist ground, Ste. Anne des Monts River, Gaspé Co., Que.; on stones in woods at Ottawa; on logs in woods at Belleville, Brighton, Wooler and Lake Superior, Ont.; on logs, Green Lake, N.W.T.; decayed trunks, Moose Mountain, Assiniboia; on logs along Peace River, lat. 56°; on stones at Morley, Hector and Banff, Rocky Mountains; on logs at Agassiz, B.C.; and on earth at Victoria, Vancouver Island. (*Macoun.*) Common in cedar swamps at London, Ont. (*J. Dearness.*) Saskatchewan. (*Bourgeau.*) Pend d'Oreille River, B.C. (*Lyall.*) In marshy ground; rare. (*Drummond.*) Kotzebue Sound. (*Roth. Alask.*) Cape Vancouver, Alaska, 1891. (*J. M. Macoun.*) Greenland. (*Fl. Gr.*)

* **B. mammilligerum,** Kindb. (n. subsp.)

Moncœcious. Tufts very dense and radiculose. Stem subpinnate. Leaves very patent in a dry state, striate, long, narrowly ovate-lanceolate, often filiform-pointed, borders not, or narrowly, recurved, faintly serrate; alar cells few; costa ordinarily vanishing in the middle, sometimes longer. Perichetial leaves long-aristate. Perigonial leaves subuliform-pointed. Capsule suboval, curved; segments narrowly rimose, not open; cilia nodose, not appendiculate; annulus none; lid mammillate; pedicel long, smooth.

On old wet logs near a spring along the road leading south from Sicamous, B.C., July 19th, 1889. (*Macoun.*)

Since the true *Brachythecium salebrosum* is an object of so many contrary descriptions by different authors, we have preferred to propose this form separately.

Schimper says, Syn. muscor. Europ. ed. 2, II, 641 :—operculo conico, annulo angusto, processus in carina hiantes.

Lesq. & James, Mosses of N. America, p. 336 :—operculum conical, annulus narrow, cilia articulate.

C. Mueller, Syn. Muscor. Omn., II., 359 :—folia caulinæ laxe imbricata, late ovata longe latiuscule acuminata, perichetialia longe reflexa acuminata ; theca exannulata ; operculo conico acuto, perist. d. int. valde hiantes, ciliis appendiculatis. From the last description the present one differs considerably.

(719.) **B. glareosum,** (Bruch), Bryol. Europ. ; C. Muell., syn. 361.

Hypnum lutescens, Drumm. Musc. Bor.-Am., No. 174.

About the roots of trees. (*Drummond.*) On earth at the roots of trees in woods west of the Columbia River at Revelstoke, B.C. (*Macoun.*)

(720.) **B. Rœllii,** Ren. & Card.

Near Victoria, Vancouver Island. (*Dr. Rœll.*)

(721.) **B. lævisetum,** Kindb., Bull. Torr. Bot. Club, XVII., 279.

Habit of *B. populeum.* Plants cæspitose, green and glossy. Stem irregularly ramulose. Leaves close, sub-erect, open, ovate-lanceolate, acuminate and acute, sulcate ; borders serrulate from the middle upwards ; basal cells dilatate ; costa long, reaching at least two-thirds of the leaf. Capsule small, incurved, oblong ; outer teeth hyaline-margined, light brown ; cilia short and not appendiculate ; perichetial leaves nerveless ; lid highly convex, not apiculate ; pedicel very smooth. Monœcious.

In small quantity on a rotten log in the valley of Eagle River at Craigellachie, Gold Range, B.C., July 18th, 1889. (*Macoun.*)

(722.) **B. acutum,** (Mitt.) Sulliv. Icon. Suppl. 99.

Hypnum (*Brachythecium*) *acutum,* Mitt. ; Lesq. & James, Mosses of N. America, 337 ; Canadian Musci, No. 438.

Pack River, British Columbia. (*Lyall.*) Mansfield Island, Hudson Strait, 1885. (*R. Bell.*) On earth in wet woods, Beechwood, Ottawa, Ont. ; and west of Hull, Que. ; on logs at Hastings, and on earth at Quesnel, B.C. (*Macoun.*)

(723.) **B. albicans,** Bruch & Schimp., Bryol. Europ.

Hypnum (*Brachythecium*) *albicans*, Neck. ; Lesq. & James, Mosses of N. America, 337 ; Canadian Musci, No. 285, in part ; Drumm. Musc. Bor.-Am., No. 173.

Hypnum salebrosum, Drumm. Musc. Bor.-Am., No. 175, in part.

Rocky Mountains. (*Bourgeau.*) Heart's Delight, Newfoundland. (*Rev. A. Waghorne.*) Bass River, N.B. (*Fowler's Cat.*) On earth at Salt Lake, Anticosti ; on earth in woods, Brackley Point, Prince Edward Island ; on rotten logs in a swamp at Brighton, Ont. ; on rotten logs at Owen Sound, Ont. ; on rotten logs, Roger's Pass, Selkirk Mountains ; on earth at Yale and Quesnel, B.C. ; on sand at Comox Bar, Vancouver Island. (*Macoun.*) On dry barren ground amongst grass (No. 173) ; in marshy ground (No. 175). (*Drummond.*) St. Paul Island, Behring Sea. (*Palmer.*) Greenland. (*Fl. Gr.*)

(724.) **B. harpidioides,** C. M. & Kindb. (n. sp.)

Tufts compact, soft, radiculose below, whitish or bright green, not shining. Stems intricate, irregularly branching or pinnate. Leaves patent, somewhat loosely disposed, decurrent, more or less arcuate (principally the upper), not auricled, plicate, nearly flat, ovate and subulate-acuminate ; borders faintly denticulate and recurved often all around ; cells distinctly chlorophyllose, the alar large, subquadrate, the other lanceolate. Dicœcious. Capsules not found.

This species resembles some forms of *Brachythecium albicans*, but is very peculiar in the arcuate leaves as in the section *Harpidium* of the genus *Hypnum*.

On old logs in woods along the Columbia River above Revelstoke, May 6th, 1890. (*Macoun.*) On logs in woods at Canaan Forks, Queen's Co., N.B., 1889. (*J. Moser.*)

(725.) **B. cirrhosum,** (Schwaegr) Schimp. Syn. ed. II., 866.

Greenland. (*Fl. Gr.*)

(726.) **B. trachypodium,** (Brid.) Bryol. Europ. VI.

Greenland. (*Fl. Gr.*)

(727.) **B. pseudo-albicans,** Kindb., Bull. Torr. Bot. Club, XVII., 278.

Hypnum (*Brachythecium*) *albicans*, Neck. var. (?) or n. sp. ; Canadian Musci, No. 285, in part.

Differs from the true *B. albicans* (Neck.), in having the leaves looser, sub-distichous, shorter-acuminate, faintly striate, denticulate all

around; the alar cells greater, all the basal cells finally reddish. Barren.

On earth in woods at Comox, Vancouver Island, May 5th, 1887. (*Macoun.*)

(728.) **B. platycladum,** C. M. & Kindb. (n. sp.)

Hypnum (*Brachythecium*) *Rutabulum*, Canadian Musci, No. 287, in part.

Tufts densely cohering, bright-green, shining. Stem irregularly branching; branches short, obtuse, complanate. Leaves loosely imbricate or patent, nearly flat, long-decurrent, distinctly auriculate, faintly striate, broad, ovate, suddenly and generally short-acuminate; borders not recurved, faintly sinuolate or sub-entire below the middle, more distinctly denticulate above; cells pale, the upper narrow, the lower near the base dilated, the alar large and well-defined; costa short, reaching little above the middle. Capsule suboval, faintly curved; teeth dark-yellow, entire at the borders; cilia not appendiculate; lid unknown; pedicel rough, about 2 cm. long or shorter. Perichetial leaves long, filiform-acuminate, the point arcuate. Dicœcious.

Differs from *B. Rutabulum* principally in the long-decurrent auricled leaves and the dicœcious inflorescence; from *B. rivulare* in the peristome, &c.

On stones by brooks in woods west of Ottawa, Ont., May 21st, 1885. (*Macoun.*)

(729.) **B. gemmascens,** C. M. & Kindb. (n. sp.)

Tufts very dense, green, finally rufescent. Stem irregularly branching, furnished with numerous male buds. Leaves narrow, ovate-lanceolate with a twisted point, faintly denticulate all around, crowded, not decurrent nor auricled; cells pale, nearly all narrow, only the lowest 1-2 rows of the basal dilated, the alar not larger than the inner; costa prolonged above the middle, vanishing below the acumen. Capsule small, round-oval, oblique; teeth dark-orange, segments shorter than the very high basal membrane, cilia not appendiculate; lid conic, short-pointed; pedicel minutely verrucose, about 1 cm. long. Monœcious. This species seems to be allied to *B. Starkii*, but well-distinct.

On wet logs along the Columbia River, above Revelstoke, B.C., May 12th, 1890. (*Macoun.*)

(730.) **B. Donnellii,** Aust. Coult. Bot. Gaz. IV., 162.

Hypnum (*Brachythecium*) *Donnellii*, Aust.; Lesq. & James, Mosses of N. America, 338.

On rocks in McKay's woods, near Ottawa, Ont. (*Macoun.*)

(731.) **B. collinum,** Bruch & Schimp. Bryol. Europ.

Hypnum (*Brachythecium*) *collinum*, Schleich. ; Lesq. & James, Mosses of N. America, 339 ; Canadian Musci, No. 398.

On gravel on the prairie south of the Touchwood Hills, Assiniboia ; on earth in the Cypress Hills, Alberta ; on stones at the mouth of Smoky River, lat. 56° 20′ ; on dry rocks at Morley, Rocky Mountains ; in ravines at Kamloops and on dry rocks at Lytton, B.C. (*Macoun.*) Cascade Mountains, B.C. (*Lyall.*) Greenland. (*Fl. Gr.*)

(732.) **B. pseudo-collinum,** Kindb. (n. sp.)

Agrees with *Brachythecium collinum* in the pinnate and creeping stem, the decurrent leaves denticulate all around, the short, suboval capsule and the smooth pedicel; differs in the stems not being julaceous, the leaves larger and longer, ovate-lanceolate, more loosely disposed, spreading or patent, gradually tapering into the short, half-twisted acumen, the cells chlorophyllose, the alar ones larger, the costa longer, reaching above the middle. Monœcious.

The true *Brachythecium collinum* has short-ovate, appressed and imbricate leaves, suddenly narrowed with a prolonged filiform, not twisted, point; the upper cells are hyaline, the alar small, the costa generally short, reaching to the middle. It is a high-alpine plant.

Under a platform of a well at Canaan Forks, Queen's Co., N.B. (*J. Moser.*)

(733.) **B. velutinum,** Bruch & Schimp. Bryol. Europ.

Hypnum (*Brachythecium*) *velutinum*, Linn. ; Lesq. & James, Mosses of N. America, 339 ; Canadian Musci, No. 379.

Pend d'Oreille River, B.C. (*Lyall.*) On the bases of trees in woods at Belleville, Ont. ; on earth in Gilmour's Park, Chelsea, Que. ; on earth in woods, Brackley Point, Prince Edward Island. (*Macoun.*) On earth near London, Ont. (*J. Dearness.*)

(734.) **B. Starkii,** Bruch & Schimp. Bryol. Europ.

Hypnum (*Brachythecium*) *Starkii*, Brid. ; Lesq. & James, Mosses of N. America, 341 ; Canadian Musci, No. 284.

Near New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Bass River, N.B. (*Fowler's Cat.*) Greenland. (*Fl. Gr.*) Miquelon Island. (*Delàmare.*) Abundant on old logs and earth in woods at Rustico Bay, Prince Edward Island ; on stones in brooks west of Ottawa ; quite common on logs at Owen Sound, Ont. ; at Comox, Vancouver Island. (*Macoun.*)

(735.) **B. œdipodium,** (Mitt.)

Hypnum (*Brachythecium*) *œdipodium*, Mitt. ; Lesq. & James, Mosses of N. America, 342 ; Canadian Musci, No. 380, in part.

Lake Huron. (*Dr. Todd.*) Pack River, B.C. (*Lyall.*) Abundant in woods at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On old logs and earth in woods around Ottawa ; on old logs in woods along the Columbia River at Revelstoke, B.C. (*Macoun.*)

(736.) **B. curtum,** Lindb.

B. œdipodium, Canadian Musci, No. 380, in part.

On earth in woods at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Very common at Brackley Point and Hunter's River, Prince Edward Island ; also in McKay's bush, Ottawa, Ont. (*Macoun.*) Confounded with *B. Starkii.*

(737.) **B. reflexum,** Bruch & Schimp. Byrol. Europ.

Hypnum (*Brachythecium*) *reflexum*, Starke ; Lesq. & James, Mosses of N. America, 342 ; Canadian Musci, No. 286.

Miquelon Island. (*Delàmare.*) Battle Harbor, coast of Labrador. (*Rev. A. Waghorne.*) Bass River and Fredericton, N.B. (*Fowler's Cat.*) Bases of trees, Gunn River, Anticosti ; bases of trees and on earth at Hunter's River and Brackley Point, Prince Edward Island ; on earth along the Gaspé coast and at the base of Mount Albert, Gaspé Co., Que. ; on stones in woods at Owen Sound, Ont. ; on stones along the Red Deer River, west of Lake Winnipegoosis, Man ; on earth at the bases of trees in woods at Revelstoke, B.C. (*Macoun.*) Greenland. (*Fl. Gr.*)

(738.) **B. Rutabulum,** Bruch & Schimp. Bryol. Europ.

Hypnum (*Brachythecium*) *Rutabulum*, Linn. ; Lesq. & James, Mosses of N. America, 342 ; Canadian Musci, No. 287, in part ; Drumm. Musc. Bor.-Am , Nos. 178, 179.

Upper Canada, near Nottawasaga Portage (179) ; shady woods ; (178). (*Drummond.*) Placentia Bay and Green Harbor, Newfoundland. (*Rev. A. Waghorne.*) Bass River, N.B. (*Fowler's Cat.*) Miquelon Island. (*Delàmare.*) Pictou Co., N.S. (*McKay.*) Wet ground, Dundas Ravine, near Hamilton, Ont. (*Burgess.*) This species is probably rare in Canada and often confounded with other ones.

(739.) **B. spurio-rutabulum,** C. M. & Kindb. (n. sp.)

Differs from *Brachythecium Rutabulum* in the dicœcious inflorescence, the leaves distinctly plicate, longer cuspidate, and the rough, short

pedicel, about 1 cm. long. The tufts are dense, the stems pinnate and creeping, the leaves shining, when dry very patent, loosely disposed, long-decurrent, borders recurved below to the middle, faintly denticulate.

On the bases of trees, North Arm, Burrard Inlet, B.C., April 29th, 1889; also at Sicamous, B.C. (*Macoun.*)

(740.) **B. leucoglaucum,** C. M. & Kindb. (n. sp.); Canadian Musci, No. 591.

Tufts loose with few rhizoids, whitish or subglaucous-green, faintly shining. Stem sub-pinnate or irregularly branching. Leaves from the ovate base suddenly tapering into a somewhat long-filiform, often half-twisted, point, sharply serrate above, faintly denticulate below, striate, decurrent, borders reflexed below; alar cells small, numerous, the others narrow; costa long, sometimes subpercurrent. Perichetial leaves long, filiform-acuminate, arcuate-squarrose. Capsule curved, oblong-cylindric; lid subobtuse when moist; pedicel faintly rough, about 1·5 cm. long; peristome conic-connivent, teeth serrulate, pale above, segments open in the middle, papillose above, cilia not appendiculate. Monœcious. Intermediate between *Brachythecium Rutabulum* and *B. curtum.*

On loose earth at Canaan Forks, Queen's Co., and Elmwood, King's Co., N.B., September 10th, 1888. (*J. Moser.*)

(741.) **B. rutabuliforme,** Kindb. (n. sp.)

Agrees with *Brachythecium Rutabulum* in the very rough pedicel, the monœcious inflorescence and the form of the leaves; differs principally in the rigid stem, the distinctly appendiculate cilia of the peristome and the short pedicel, about 1 cm. The leaves are subovate, short-acuminate, nearly estriate and faintly denticulate.

Growing on stones in a brook north of Spence's Bridge, B.C., May 30th, 1889. (*Macoun.*)

(742.) **B. Columbico-rutabulum,** Kindb. (n. sp.)

Tufts dense, faintly shining, finally brownish-green. Stem elongate, pinnate, creeping. Stem-leaves patent, from the broadly ovate base long-cuspidate with a filiform, generally prolonged point, decurrent, very plicate, nearly entire, borders shortly reflexed below; cells not chlorophyllose, the alar larger and well-distinct. Perichetial leaves suberect-patent with a long, filiform, arcuate point, faintly and distantly denticulate. Capsule oblong-cylindric, curved; peristomial teeth not serrulate, segments very open in the middle, cilia faintly

nodulose, not appendiculate; pedicel very rough, about 2 cm. long. Monœcious.

This species resembles *Brachythecium spurio-rutabulum* in habit, but the leaves are still more plicate and nearly entire; the pedicel also is longer. It differs from *Brachythecium Rutabulum* only in the very plicate leaves, etc.

On very wet and rotten logs in woods along the Columbia River about one mile above Revelstoke, B.C., May 13th, 1890. (*Macoun.*)

(743.) **B. lamprochryseum,** C. M. & Kindb. (n. sp.)

Tufts large, laxly cohering to the substrate with few rhizoids, golden-yellow, shining or finally decolorate. Stem elongate, often pinnate; branches generally short or sometimes more elongate and faintly curved above, subacute. Leaves open, more or less loosely disposed, long-decurrent, distinctly auriculate, very plicate, from the triangular-ovate base short-acuminate, filiform or subulate-cuspidate, often curved at apex, nearly flat, only the auricles faintly revolute; borders faintly denticulate all around; most of the cells long and very narrow, the lowest basal ones dilated and short, also the alar, all very sparingly chlorophyllose; costa broader at the base, faint, reaching to the middle, but in the smaller narrower and more loosely disposed leaves of some branchlets longer, reaching to the acumen. Capsule short, sub-ovoid, thicker near the base, slightly contracted below the mouth, arcuate; lid unknown; teeth finally brown at least at the base; cilia not appendiculate; pedicel very rough, about 3 cm. long. Perichetial leaves nerveless, when dry squarrose, the inner sheathing with a short, subulate acumen and a long, filiform point. Monœcious.

Allied to *Brachythecium Rutabulum*, but distinct in the nearly plane (not concave), auriculate, long-decurrent and very plicate leaves.

On stones, Mount Finlayson near Goldstream; on Mount Benson near Nanaimo and at Comox, Vancouver Island, 1887. (*Macoun.*)

(744.) **B. mirabundum,** C. M. & Kindb. (n. sp.)

Tufts large, very laxly cohering, nearly without rhizoids, silky or yellowish-green, faintly shining. Stem elongate, irregularly divided or prolonged, into sciuroid-curved, obtuse branches. Leaves loosely imbricate, crowded, when dry subrugose, when moist patent, short-decurrent, indistinctly auriculate, faintly plicate, from the concave, ovate and gradually acuminate base long-cuspidate; borders broadly recurved at least at one side of the nearly entire base to the involute and distinctly denticulate acumen; cells pale, elongate, and narrow, the alar subquadrate and not much wider than the other basal ones, all

sparingly chlorophyllose; costa vanishing in the acumen. Capsule small, at the base indistinctly gibbous, narrow, cylindric, and curved; lid elongate-conic; pedicel very short, 0.5—0.8 cm., very faintly muriculate. Perichetial leaves nerveless, longer filiform-cuspidate, irregularly sinuolate, the point patent or arcuate; basal cells larger, rectangular; archegonia numerous, about 20. Monœcious.

This species is allied to *Brachythecium Rutabulum*, differs principally in the minutely muriculate and short pedicel of the small, narrow capsule, also in the leaves.

On old logs in woods, Canaan Forks, Queen's Co., and Elmwood, King's Co., N.B., July, 1888. (*J. Moser.*)

(745.) **B. asperrimum,** (Mitt.)

Hypnum (*Brachythecium*) *asperrimum*, Mitt.; Lesq. & James, Mosses of N. America, 343.

British Columbia. (*Lyall, Douglas.*) On earth at Quesnel, B.C. (*Macoun.*) On logs, Melaspina Inlet, Gulf of Georgia, B.C. (*Dawson.*)

(746.) **B. vallium,** Sulliv. & Lesq.

On old logs near Victoria, Vancouver Island, May 7th, 1875. (*Macoun.*)

(747.) **B. glaciale,** Bruch & Schimp., Bryol. Europ.

Greenland. (*Fl. Gr.*)

(748.) **B. campestre,** Bruch & Schimp., Bryol. Europ.

Hypnum (*Brachythecium*) *campestre*, Bruch; Lesq. & James, Mosses of N. America, 344.

On the ground at Bass River, N.B. (*Fowler's Cat.*) On rocks and logs, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On Kettle River, British Columbia. (*Watson.*)

(749.) **B. rivulare,** Bruch & Schimp., Bryol. Europ.

Hypnum (*Brachythecium*) *rivulare*, Bruch MS.; Lesq. & James, Mosses of N. America, 344; Canadian Musci, No. 288.
Camptothecium megaptilum, Canadian Musci, No. 439.

Miquelon Island. (*Delàmare.*) Bass River and Fredericton, N.B. (*Fowler's Cat.*) On earth at Canaan Forks, Queen's Co., and Tay, York Co., N.B. (*J. Moser.*) On damp earth, Brackley Point, Prince Edward Island; in wet woods at Ottawa; common on stones in brooks and wet woods at Belleville, Brighton, Niagara Falls, Owen Sound and

Leamington, Ont. (*Macoun.*) Cape Chudleigh, Hudson Strait. (*R. Bell.*) On stones in brooks, Little Tobique River, N.B. (*Hay.*) Greenland. (*Fl. Gr.*) Kotzebue Sound. (*Roth. Alask.*) On the base of stumps along the Canadian Pacific Railway at Hastings, B.C.; also on damp earth in Roger's Pass, Selkirk Mountains. (*Macoun.*)

Var. **obtusulum,** Kindb.

Brachythecium rivulare * *Novæ-Brunsviciæ*, Kindb. Ott. Nat. IV., 3; Canadian Musci, No. 492.

Stem irregularly divided; branches simple and elongate. Leaves glossy, ovate, blunt or short-acute, striate, decurrent, indistinctly denticulate above or from the middle; cells dilatate, principally the lower and the uppermost, the alar and basilar finally orange-reddish, the alar rarely greater; costa short and simple.

On wet rocks at Fredericton, N.B. (*Prof. Fowler.*) On a horse trough and on stones in brooks and springs at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On stones at Potawattamie Falls, Owen Sound, Ont.; in springy places at Belleville, Ont.; on logs in a marsh at Revelstoke, B.C. (*Macoun.*)

(750.) **B. nanopes,** C. M. & Kindb. (n. sp.); Canadian Musci, No. 548.

Allied to *Brachythecium populeum* in habit, in the peristome, the monœcious inflorescence, the pedicel faintly rough above, the long and subpercurrent costa of the leaves; differs however in the stems not creeping, nearly without rhizoids, the branches unilateral, the leaves smaller and narrower at the base, the stem-leaves long filiform-apiculate, subentire and not, or indistinctly, recurved at the borders, the lower decurrent; the capsule is smaller, the pedicel shorter, about 7-8 mm. long, the peristome pale-orange, the cilia long and indistinctly appendiculate.

On earth along the Columbia River above Revelstoke, B.C., May 19th, 1890. (*Macoun.*)

(751.) **B. populeum,** Bruch & Schimp. Bryol. Europ.

Hypnum (*Brachythecium*) *populeum*, Hedw.; Lesq. & James, Mosses of N. America, 345; Canadian Musci, No. 441; Drumm. Musc. Bor.-Am., No. 176.

On rocks, Pictou Co., N.S. (*McKay.*) Bass River, N.B. (*Fowler's Cat.*) Miquelon Island. (*Delamare.*) On granite boulders at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On rocks in Gilmour's Park, Chelsea, Que.; also on rocks in McKay's woods, Ottawa; on rocks,

Sudbury Junction, Ont.; on damp rocks at Owen Sound, Ont. (*Macoun.*) Upon large stones about Lake Superior; and on the rocks in Portage River, Rocky Mountains. (*Drummond.*)

(752.) **B. plumosum,** Bruch & Schimp. Bryol. Europ.

Hypnum (*Brachythecium*) *plumosum*, Swartz; Lesq. & James, Mosses of N. America, 345; Canadian Musci, No. 289; Drumm. Musc. Bor.-Am., No. 177.

Heart's Delight, Blaketown, Hopewell Bay and New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Bass River and Fredericton, N.B. (*Fowler's Cat.*) Elmwood, King's Co., and Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Miquelon Island. (*Delàmare.*) Baie St. Paul, Charlevoix Co., Que. (*St. Cyr.*) On rocks at Pirate's Cove, Straits of Canso, N.S.; on stones in McKay's woods, Ottawa; at Belleville and on stones Gull River, Victoria Co.; on stones at Colpoy's Bay, Bruce Co., and North Shore of Lake Superior and on islands in Lake Nepigon, Ont.; on stones at Quesnel, B.C. (*Macoun.*) Upon moist rocks at Lake Superior. (*Drummond.*)

(753.) **B. turgidum,** Hartm. Skand. Fl. ed. X. 16.

In peat bogs, Stephen, Rocky Mountains, (*Macoun.*) Greenland. (*Fl. Gr.*)

120. SCLEROPODIUM, Schimp.

(754.) **S. cæspitosum,** Bruch & Schimp. Bryol. Europ.

Hypnum cæspitosum, Wils.; Lesq. & James, Mosses of N. America, 346; Canadian Musci, No. 290.

Alaska. (*Kellogg.*) On rocks, Mount Tolmie and Mount Finlayson, near Victoria, Vancouver Island. (*Macoun.*)

(755.) **S. obtusifolium,** (Hook.) Kindb.

Hypnum (*Limnobium*) *obtusifolium*, Hook; Lesq. & James, Mosses of N. America. 400; Canadian Musci, No. 359; Drumm. Musc. Bor.-Am., No. 193.

In a rivulet in the Rocky Mountains. (*Drummond.*) On rocks in brooks at Revelstoke; wet rocks in a brook at Deer Park, Columbia River; on stones in mountain brooks at Griffin Lake, Spence's Bridge, Yale and Agassiz, B.C.; common at Goldstream, on Mount Benson and on the falls of Somas River near Alberni, Vancouver Island. (*Macoun.*)

(756.) **S. Krausei,** C. Mueller.

Alaska. (*Krause.*)

(757.) **S. illecebrum,** (Schwaegr.) Bryol. Europ.

Hypnum illecebrum, Schwaegr; Lesq. & James, Mosses of N. America, 347.

Alaska. (*Kellogg.*)

121. ISOTHECIUM, Brid.

(758.) **I. myosuroides,** Brid. Bryol. Univ. II., 369.

Hypnum myosuroides, Linn. ; Lesq. & James, Mosses of N. America, 347 ; Canadian Musci, No. 291, in part.

On stumps and old logs, Melaspina Inlet, Gulf of Georgia, B.C. (*Dawson.*) On old logs at Comox, Vancouver Island. (*Macoun.*) On trees, Nova Scotia. (*James.*) On trees at New Harbor, Hopewell Bay and Speedwell Bay, Newfoundland. (*Rev. A. Waghorne.*)

(759.) **I. stoloniferum,** (Hook.) Brid. Bryol. Univ. II., 371.

Hypnum stoloniferum, Hook. ; Lesq. & James, Mosses of N. America, 348 ; Canadian Musci, No. 292, in part.
H. myosuroides, Canadian Musci, No. 291, in part.
H. spiculiferum, Canadian Musci, No. 293, in part.

Vancouver Island. (*Wood.*) British Columbia. (*Lyall.*) North-west America. (*Menzies.*) Nootka Sound. (*Barclay.*) Forward Inlet, Gulf of Georgia, B.C. (*Dawson.*) On rocks, North Arm, Burrard Inlet ; on trees, very common, in woods at Hastings, B.C. ; very abundant on old logs near the sea at Comox, Vancouver Island. (*Macoun.*)

(760.) **I. Cardoti,** Kindb. Bull. Torr. Bot. Club, XVII., 278 ; Canadian Musci, No. 394.

On the bases of trees at Hastings, B.C. ; also on logs near Victoria, Vancouver Island. (*Macoun.*) Queen Charlotte Islands ; on logs Melaspina Inlet, Gulf of Georgia, B.C. (*Dawson.*)

(761.) **I. lentum,** (Mitt.) Lesq. & James.

Hypnum lentum, Mitt. ; Lesq. & James, Mosses of N. America, 350.
H. stoloniferum, Canadian Musci, No. 292, in part.

North-west coast of America. (*Douglas.*) On trees in the vicinity of Victoria, Vancouver Island. (*Macoun.*)

(762.) **I. Brewerianum,** (Lesq.) Lesq. & James.

Hypnum Brewerianum, Lesq. ; Lesq. & James, Mosses of N. America, 349 ; Canadian Musci, No. 294, in part.

On rocks, North Arm, Burrard Inlet, B.C. ; also on rocks at Esquimault, near Victoria, Vancouver Island. (*Macoun.*)

(763.) **I. myurellum,** Kindb. Bull. Torr. Bot. Club, XVII., 278 ; Canadian Musci, No. 397.

Tufts very loose, dark green, not glossy. Stems creeping; branches (secondary stems) erect, tree-like and ramose ; branchlets curved, attenuate. Leaves of the branches appressed when dry, small, ovate, blunt or short-acuminate, twice serrate or denticulate all around, smooth, scarcely reflexed on the borders ; alar cells round-quadrate, the middle ones narrow, upper rhombic ; costa long, three-fourths the length of the leaf. Perichetial leaves nerveless, oblong with a long, denticulate, horizontally patent acumen and narrow cells. Capsule oval-oblong, inclined ; segments with a low basilar membrane and two short cilia ; annulus double ; lid conical, acuminate ; pedicel smooth. Dicœcious.

On decaying logs and rocks below the railway bridge over the Nanaimo River, Vancouver Island. (*Macoun.*) Drew's Harbor, Gulf of Georgia, B.C. (*Dawson.*)

(764.) **I. spiculiferum,** (Mitt.) Lesq. & James.

Hypnum spiculiferum, Mitt. ; Lesq. & James, Mosses of N. America, 348.

British America. (*Lyall, Douglas.*)

(765.) **I. acuticuspis,** (Mitt.) Lesq. & James.

Hypnum acuticuspis, Mitt. ; Lesq. & James, Mosses of N. America, 349.

British Columbia. (*Douglas.*)

(766.) **I. aggregatum,** (Mitt.) Lesq. & James.

Hypnum aggregatum, Mitt. ; Lesq. & James, Mosses of N. America, 350.

Vancouver Island. (*Lyall.*) British Columbia. (*Douglas.*)

(767.) **I. aplocladum,** (Mitt.) Lesq. & James.

Hypnum aplocladum, Mitt. ; Lesq. & James, Mosses of N. America, 350.

North-west coast of America. (*Douglas.*)

122. EURHYNCHIUM, Schimp.

(768.) **E. strigosum,** (Hoffm.) Bruch. & Schimp. Bryol. Europ.

Hypnum strigosum, Hoffm. ; Lesq. & James, Mosses of N. America, 351 ; Canadian Musci, No. 295 ; Drumm. Musc. Bor.-Am., No. 183.
Hypnum substrigosum, Canadian Musci, No. 449, in part.

Pictou Co., N.S. (*McKay.*) Bass River, N.B. (*Fowler's Cat.*) On earth in woods, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Roots of trees, South West Point, Anticosti ; on earth at Brackley Point, Prince Edward Island ; on earth in woods, Gaspé Co., Que. ; on earth and stones in McKay's woods, Ottawa ; on the earth in woods at Belleville, Wooler and Owen Sound, also Sudbury Junction and Lake Nepigon, Ont. ; shaded ground, Lake Winnipegoosis, Man. ; on earth at Kicking Horse Lake, Rocky Mountains ; on earth in woods at Agassiz and Yale, B.C. (*Macoun.*) Rocky Mountains. (*Bourgeau.*) Galton Mountains, B.C. (*Lyall.*) Nulato, Alaska. (*Roth. Alask.*) Greenland. (*Fl. Gr.*)

(769.) **E. diversifolium,** (Schimp. MS.) Bruch & Schimp. Bryol. Europ.

Hypnum diversifolium, Schimp. MS. ; Lesq. & James, Mosses of N. America, 352 ; Canadian Musci, No. 500.

On earth in woods at Ottawa ; on sandy soil, Dawson Route, west of Lake Superior ; on earth near Lesser Slave Lake, N.W.T. ; on earth at Quesnel and Hastings, B.C. ; on rocks at Deer Park, Lower Arrow Lake and at Pass Creek Falls, near Sproat, B.C. (*Macoun.*) Greenland. (*Fl. Gr.*)

(770.) **E. substrigosum,** Kindb. (n. sp.) ; Canadian Musci, No. 449, in part.

Differs from *E. strigosum* in the distant branches, being complanate, the leaves long-decurrent, and twice greater, patent, sub-distichous, the capsule (unripe) very constricted below the orifice, the cilia appendiculate and the inflorescence monœcious.

On rocks along Lake Mara, near Sicamous, B.C., July 3rd, 1889. (*Macoun.*)

(771.) **E. Vaucheri,** (Schimp.)

Hypnum Vaucheri, Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 414.

On rocks along the Gaspé coast, Que., August 2nd, 1882 ; on rocks, " Dry Cañon," discharge of Devil's Lake, Rocky Mountains. (*Macoun.*)

St. George Island, Behring Sea, 1891. (*J. M. Macoun.*) Canada. (*Macoun* fide *Austin.*)

(772.) **E. piliferum,** (Schreb.) Bruch & Schimp. Bryol. Europ.

Hypnum piliferum, Schreb. ; Lesq. & James, Mosses of N, America, 353.

Greenland. (*Fl. Gr.*) Canaan Forks, Queen's Co., N.B. (*J. Moser.*)

(773.) **E. Boscii,** (Schwaegr.)

Hypnum Boscii, Schwaegr, ; Lesq, & James, Mosses of N. America, 352.
H. illecebrum, Drumm. Musc. Bor.-Am., No. 192.

On the ground in (Ontario) Upper Canada. (*Drummond.*) Doubtful.

(774.) **E. Dawsoni,** Kindb. Bull. Torr. Bot. Club, XVII., 278.

Stems pinnate, not or rarely radiculose ; branchlets patent. Leaves green or brownish, not glossy, not, or indistinctly, papillose, not long-acuminate from the broad, ovate base, recurved on the borders below, long-decurrent, open-erect, denticulate all around ; areolation variable, often sub-rhomboidal ; costa thick, reaching nearly to the apex. Probably dicœcious. Allied to *E. hians* and *E. Sullivantii*.

On rocks along the Nanaimo River, below the railway bridge, Nanaimo, Vancouver Island, April 26th, 1887 ; on stones in a ditch, west side of Black's hotel, Hastings, B.C., 1889. (*Macoun.*)

(775.) **E. prælongum,** Bruch & Schimp. Bryol. Europ.

Tay, York Co., N.B. (*J. Moser.*)

(776.) **E. Sullivantii,** (Spruce.) Lesq. & James.

Hypnum Sullivantii, Spruce, MS. ; Lesq. & James, Mosses of N. America, 353 ; Canadian Musci, No. 296.

On rocks at Truro, N.S. (*Fowler's Cat.*) On rocks at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On rocks at Hull, Que. ; abundant on limestone rocks, Royston Park, near Owen Sound, Ont. (*Macoun.*)

(777.) **E. hians,** (Hedw.) Lesq. & James.

Hypnum hians, Hedw. ; Lesq. & James, Mosses of N. America, 354 ; Canadian Musci, No. 442, in part.

Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On earth at Pirate's Cove, Strait of Canso, N.S. ; on earth in McKay's woods, near the lake, Ottawa ; on old logs and damp rocks at Hastings, B.C. (*Macoun.*)

(778.) **E. Stokesii,** (Turn.) Bruch & Schimp. Bryol. Europ.

Hypnum Stokesii, Turn. ; Lesq. & James, Mosses of N. America, 354 ; Canadian Musci, No. 297.
Hypnum prælongum, Linn. ; Lesq. & James, Mosses of N. America, 353.
H. hians, Canadian Musci, No. 442 in part.

British Columbia, near the 49th parallel. (*Lyall.*) Vancouver Island. (*Lyall, Wood.*) On earth in woods at Revelstoke ; abundant on wet rocks and earth at Hastings, Burrard Inlet and Agassiz, B.C. ; on rocks and old logs at Victoria, Esquimault, Nanaimo and Comox, Vancouver Island. (*Macoun.*) On rocks, Alert Bay, Vancouver Island. (*Dawson.*)

(779.) **E. Oreganum,** (Sulliv.) Lesq. & James.

Hypnum Oreganum, Sulliv. ; Lesq. & James, Mosses of N. America, 355 ; Canadian Musci, No. 298.

British Columbia, near the 49th parallel. (*Lyall.*) Vancouver Island. (*Wood.*) Very abundant on logs and the bases of trees around Victoria, Vancouver Island. (*Macoun.*) Melaspina Inlet, Gulf of Georgia, B.C. (*Dawson.*)

(780.) **E. (Brachythecium?) semiasperum,** C. M. & Kindb. (n. sp.) ; Canadian Musci, No. 507.

Plant loosely tufted, green. Secondary stems sparingly radiculose, branching at one side ; branches generally simple, acute, 1 cm. long or shorter. Leaves subpatent, from a broad-cordate base, fine acuminate, decurrent, nearly entire ; alar cells numerous, reaching to the costa ; the other cells narrower, the lower dilated ; costa vanishing above the middle. Capsule small, suboval, erect or inclined ; teeth papillose above ; segments shorter than the high basilar membrane ; lid narrow, short-rostellate ; pedicel rough at least to the middle, smooth below, 0.6 cm. long. Perichetial leaves suboblong, short-acuminate, erect, entire and nerveless. Monœcious.

The species is well-distinct from all our *Eurhynchia* and rather allied to *Brachythecium plumosum.*

On rocks in a small mountain brook at Deer Park, Lower Arrow Lake, Columbia River, B.C., June 6th, 1890. (*Macoun.*)

(781.) **E. crassinerve,** (Tayl.) Schimp. var. **laxorete,** Kindb. n. var. (n. sp. ?)

Differs in the leaves being nearly entire or faintly denticulate above, shorter-acuminate, and the cells larger. Only male flowers found.

The allied *E. colpophyllum,* (Sulliv) Lesq. & James, is described as

having " the leaves scarious with a shorter blunt point, the costa not thick, and the areolation longer and narrower."

On earth in woods at Canaan Forks, Queen's Co., N.B. (*J. Moser.*)

123. RAPHIDOSTEGIUM, Lesq. & James.

(782.) **R. recurvans,** (Schwaegr) Lesq. & James.

Hypnum recurvans, Schwaegr.; Lesq. & James, Mosses of N. America, 356; Canadian Musci, No. 299.
H. demissum, Canadian Musci, No. 443.

Miquelon Island. (*Delàmare.*) Abundant at Placentia Bay and Heart's Delight, Bay Bull Arm and Hopewell Bay, Newfoundland. (*Rev. A. Waghorne.*) Kent Co., N.B. (*Fowler's Cat.*) Abundant on trees at Ottawa, Carleton Place, Belleville, Sudbury Junction, and on roots of trees, Dawson Route, west of Lake Superior, Ont.; on trees at Gilmour's Park, Chelsea, Que., and on old logs in Dow's swamp and at Rockcliffe, near Ottawa; on bases of trees at Revelstoke, B.C. (*Macoun.*) In woods at London, Ont. (*J. Dearness.*)

(783.) **R. demissum,** (Wils.) Lesq. & James.

Hypnum demissum, Wils.; Lesq. & James, Mosses of N. America, 355.

On stones at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

(784.) **R. subdemissum,** Kindb. (n. sp.)

Differs from *R. demissum* in the branches being cuspidate, subjulaceous, leaves smaller, long-subulate, not, or indistinctly, recurved on the borders, inflorescence dicœcious.

On rocks, Kodiak Island, Alaska, September 22nd, 1891. (*J. M. Macoun.*)

(785.) **R. cylindricarpum,** (C. Muell.) Lesq. & James.

Hypnum cylindricarpum, C. Muell.; Lesq. & James, Mosses of N. America, 356.

On decayed logs at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Rather common at New Harbor, Heart's Delight Cove, and Placentia Bay, Newfoundland; on rocks, Battle Harbor, Labrador. (*Rev. A. Waghorne.*)

(786.) **R. Jamesii,** (Sulliv.) Lesq. & James.

Hypnum Jamesii, Lesq. & James, Mosses of N. America, 357.
Isothecium (?) *Dawsoni*, Kindb. Ott. Nat. IV., 65.

On stones, New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On stones along Gunn River, Anticosti; on logs at Albert Cañon, Illicillewaet River, B.C. (*Macoun.*)

(787.) **R. Rœllii,** Ren. & Card.; Canadian Musci, No. 444.

On rotten logs, in thin mats, in woods at Agassiz, B.C. (*Macoun.*)

(788.) **R. subadnatum,** C. M. & Kindb. (n. sp.)

Tufts green, intricate. Branches short, subjulaceous. Leaves close, incurved at the apex, ovate, oblong, denticulate to the middle, reflexed, at the margins below; inner cells sub-oblong, the alar and marginal quadrate, not vesiculose or yellow; costa short and double. Perichetial leaves larger and longer, appressed, a little longer acuminate. Capsule cylindric, curved, very much narrower than the rostrate lid; pedicel arcuate or flexuous. Probably monœcious.

This species differs from *Raphidostegium microcarpum* in the laxer areolation of the smaller, distinctly denticulate leaves, the capsule more than doubly longer, the large lid and the arcuate pedicel, &c.

On trees in woods at London, Ont., May, 1889. (*J. Dearness.*) On bark of trees at Fox River, Gaspé coast, Que., August 2nd, 1882. (*Macoun.*)

(789.) **R. microcarpum,** (C. Muell.) Lesq. & James.

H. microcarpum, C. Muell; Lesq. & James, Mosses of N. America, 357.

On rocks at Hastings, Burrard Inlet, B.C. (*Macoun.*) Newfoundland. (*La Pylaie, C. Muell.* Syn. 327.)

124. Rhynchostegium, Schimp.

(790.) **R. deplanatum,** Schimp., MS.

Hypnum deplanatum, Schimp., MS.; Lesq. & James, Mosses of N. America, 359; Canadian Musci, No. 300.

On flat stones in McKay's woods at Ottawa; quite common at Wooler in shady woods, also at Carleton Place, and on flat limestone at Owen Sound, Ont.; on rotten wood, Nepigon River, Ont.; on stones along Red Deer River, north-west of Lake Winnipegoosis, Man. (*Macoun.*)

(791.) **R. serrulatum,** (Hedw.) Lesq. & James.

Hypnum serrulatum, Hedw. ; Lesq. & James, Mosses of N. America, 359; Canadian Musci, No. 456.

Bay Bull Arm, Placentia Bay, Newfoundland. (*Rev. A. Waghorne.*) Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On rotten wood, Bass River, N.B. (*Fowler's Cat.*) On earth in woods at Ottawa ; also on earth in woods at Leamington, Ont. ; on old logs at Revelstoke, Agassiz and Hastings, B.C. (*Macoun.*)

(792.) **R. rusciforme,** (Weis) Schimp.

Hypnum rusciforme, Weis ; Lesq. & James, Mosses of N. America, 359 ; Canadian Musci, No. 301.

Blaketown and Green Harbor, Newfoundland. (*Rev. A. Waghorne.*) On rocks, St. John River, N.B. (*Fowler's Cat.*) On stones in Tobique River, N.B. (*Hay.*) On rocks, Never's Rapids, York Co., N.B. (*J. Moser.*) On stones in a brook, Pirate's Cove, Straits of Canso, N.S. ; abundant on stones in the brook that discharges Kingsmere, four miles from Chelsea, Que. ; on rocks at Elliott's Falls, Gull River, Victoria, Co. ; abundant in the rivers around Owen Sound, Ont. ; Somas River, Alberni and in Comox River, Vancouver Island ; on stones in Eagle River, below Griffin Lake, B.C. (*Macoun.*)

125. THAMNIUM, Schimp.

(793.) **T. Alleghaniense,** (C. Muell.) Bruch & Schimp.

Hypnum Alleghaniense, C. Muell. ; Lesq. & James, Mosses of N. America, 362 ; Canadian Musci, No. 302.

In crevices of thick-bedded limestone rocks near McKay's Lake, Ottawa ; on rocks along the Sydenham River, below Jones Falls, near Owen Sound, Ont. ; on rocks at Beaver Creek bridge over the Hastings Road, Hastings Co., Ont. ; also on rocks at Pirate's Cove, Straits of Canso, N.S. (*Macoun.*)

(794.) **T. alopecurum,** (Linn.) Schimp.

Hypnum neckeroides, Hook. ; Canadian Musci, No. 445.

Under overhanging rocks in cliffs along the Columbia River above Revelstoke, B.C. ; crevices of damp overhanging rocks along the Canadian Pacific Railway, one mile east of Agassiz, B.C. (*Macoun.*)

(795.) **T. Bigelowii,** (Sulliv.)

Hypnum Bigelowii, Sulliv.; Lesq. & James, Mosses of N. America, 362; Canadian Musci, No. 303.

North-west Coast. (*Menzies.*) On wet rocks Goldstream, near Victoria, and along the Nanaimo River, below the railway bridge, Vancouver Island. (*Macoun.*) On wet rocks, Alert Bay, Vancouver Island. (*Dawson.*)

126. PLAGIOTHECIUM, Schimp.

(796.) **P. Passaicense,** Aust. Bull. Torr. Bot. Club, V. 24.

Hypnum latebricola, Canadian Musci, No. 304.
H. Passaicense, Lesq. & James, Mosses of N. America, 363.

On cedar trees in Dow's swamp near Ottawa; abundant on old cedar stumps in swamps five miles west of Belleville, Ont.; on dead wood in swamps at Fort McLeod, lat. 65°, B.C. (*Macoun.*)

(797.) **P. latebricola,** Bruch & Schimp. Bryol. Europ.

Hypnum latebricola, Lindb. Ms.; Lesq. & James, Mosses of N. America, 363.

On stumps in McKay's woods, near the lake, Ottawa, Ont. (*Macoun.*)

(798.) **P. pseudo-latebricola,** Kindb. (n. sp.)

Tufts dense and radiculose, glossy green. Stem irregularly branching; branches often curved, perfectly complanate, branchlets longer with smaller and narrower leaves. Stem-leaves small, distichous, not decurrent, shortly ovate-lanceolate suddenly tapering to a somewhat long, filiform and straight point, entire; cells narrow, the alar small, few and subquadrate, often wanting; costa obsolete. Perichetial leaves sinuolate above. Capsule obovate-oblong, oblique and faintly curved, often pendent, teeth pale; inner membrane clavate; cilia long, subappendiculate; lid conical; pedicel about 12 mm. long. Dicœcious. Allied to *P. Passaicense.*

On rotten wood along the Columbia River, on both sides of the river at Revelstoke, May 3rd and 12th, 1890. (*Macoun.*)

(799.) **P. bifariellum,** Kindb. Bull. Torr. Bot. Club, XVII. 279.

P. Americanum. Kindb. enum. bryin. exotic.

Plants small, sparingly radiculose, loosely cæspitose, dark or blackish green, not glossy. Stems rigid, pinnate. Leaves loose, small, spreading, smooth and not striate; stem-leaves at the base broadly ovate-

cordate, decurrent, serrulate all around, abruptly attenuate to the filiform, hooked-deflexed and sub-entire acumen; cells narrow, linear, the basal oblong; costa obsolete or reaching to the middle. Dicœcious.

This species is still doubtful, as it is found only in a barren state. It resembles rather a *Brachythecium*.

Wet places in woods at Comox, Vancouver Island, May 3rd, 1887. (*Macoun.*)

(800.) **P. trichophorum,** (Spruce) Lesq. & James.

Hypnum trichophorum, Spruce; Lesq. & James, Mosses of N. America, 364; Canadian Musci, No. 305.
H. denticulatum var. *Donianum*, Drumm. Musc. Bor.-Am, No. 165.
H. pulchellum, Canadian Musci, No. 306, in part.

Rocks of the Portage River, Rocky Mountains. (*Drummond.*) On wet rocks in Roger's Pass, Selkirk Mountains; on stones in a brook at Revelstoke, Columbia River, and at Yale, B.C.; on damp rocks, Mount Benson, Vancouver Island. (*Macoun.*)

(801.) **P. pulchellum,** (Dicks.) Bruch & Schimp. Bryol. Europ.

Hypnum pulchellum, Dicks.; Lesq. & James, Mosses of N. America, 364; Canadian Musci, No. 306, in part; Drumm. Musc. Bor.-Am., No. 167.

Banks of a stream, among the Rocky Mountains. (*Drummond.*) With *Ulota crispa* on trees at Trinity Bay, Newfoundland. (*Rev. A. Waghorne.*) On rotten wood at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On roots of trees and rocks along the Gaspé coast; on roots of spruce trees in woods around Lake Nepigon, Ont.; on stumps and rocks at Kicking Horse Lake and Lake Louise, Rocky Mountains; on rocks, Roger's Pass, Selkirk Mountains, B.C.; on earth near McLeod's Lake, lat. 55°, B.C. (*Macoun.*) On dead wood, Athabasca River, N.W.T.; St. Paul and Ounalaska islands, Behring Sea. 1891. (*J. M. Macoun.*)

Var. **nitidulum,** Lesq. & James; Canadian Musci, No. 307.

On roots of trees, Jupiter River, Anticosti; on the bases of trees, Gaspé Co., Que.; on earth, Kiladar, Addington Co., Ont.; on earth at Belleville, Ont.; also on earth at Current River, near Port Arthur, Lake Superior. (*Macoun.*) Greenland, (*Fl. Gr.*)

(802.) **P. geminum,** (Mitt.) Lesq. & James.

Hypnum geminum, Lesq. & James, Mosses of N. America, 365.

Rocky Mountains, alt. 7,000—8,000 feet, associated with *P. pulchellum*. (*Lyall.*)

(804.) **P. Silesiacum,** (Selig.) Schimp.

Hopewell Bay and Topsail Harbor, Newfoundland. (*Rev. A. Waghorne.*) Canaan Forks, Queen's Co., N.B. (*J. Moser.*)

(805.) **P. turfaceum,** Lindb. Faun. Flor. Fenn. IX. 33.

Hypnum turfaceum, Lindb.; Lesq. & James, Mosses of N. America, 366; Canadian Musci, No. 308.

Miquelon Island. (*Delàmare.*) On stumps at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Pictou Co., N.S. (*McKay.*) On stumps at Bass River, and Grand Lake, N.B. (*Fowler's Cat.*) Roots of trees, McNab's Island, Halifax Harbor, and on earth, Pirate's Cove, Straits of Canso, N.S.; on stumps, Gunn River, Anticosti; on old stumps at Hunter's River, Brackley Point, and Otter Pond, Prince Edward Island; on dead wood, Gaspé coast, and stumps, Ste. Anne des Monts River, Gaspé Co., Que.; on rotten stumps at Chelsea, Que.; common on stumps in Dow's swamp, Ottawa; on stumps at Carleton Place, Belleville, Wooler, Owen Sound, and Lake Nepigon, Ont.; dead wood along Lake Winnipegoosis, Man.; on logs, Deer Park, Lower Arrow Lake, Columbia River, B.C.; and on rotten wood, Lake Athabasca, N.W.T. (*Macoun.*) Observation Point, Lake Winnipeg. (*J. M. Macoun.*) In cedar and tamarac swamps at London, Ont. (*J. Dearness.*)

(806.) **P. elegans,** (Hook.) Schimp.

Hypnum elegans, Hook.; Lesq. & James, Mosses of N. America, 366; Canadian Musci, No. 309.

Pictou Co., N.S. (*McKay.*) Miquelon Island. (*Delàmare.*) Bay Bull Arm, Placentia Bay, Hopewell Bay and New Harbor, Newfoundland; Little Bay Islands, Labrador. (*Rev. A. Waghorne.*) In a coniferous swamp at London, Ont. (*J. Dearness.*) On rocks, Salt Lake, Anticosti; on old logs at Belleville, Ont.; on rocks at Lake Nepigon, Ont.; on earth at Revelstoke, Columbia River; on rocks at Sicamous and on old logs and stumps at Hastings, Burrard Inlet, B.C.; on rotten wood at Comox, Vancouver Island. (*Macoun.*) Crevices of shaded rocks, Vancouver Island. (*Menzies.*)

(807.) **P. Muehlenbeckii,** Bruch & Schimp. Bryol. Europ.

Hypnum Muehlenbeckii, Spruce; Lesq. & James, Mosses of N. America, 370.

Miquelon Island. (*Delàmare.*) Pictou Co., N.S. (*McKay.*) On old logs, Bay Bull Arm, Placentia Bay, Newfoundland; Cape Charles

and Battle Harbor, Labrador. (*Rev. A. Waghorne.*) On old logs, Bass River, and St. John, N.B. (*Fowler's Cat.*) On dead wood, Tobique River, and at Norton, N.B. (*Hay.*) Old logs, Jupiter River, Anticosti; on rotten logs in shady woods in Hastings Co., near Belleville, and in Brighton, Northumberland Co., Ont. (*Macoun.*) Greenland. (*Fl. Gr.*)

(808.) **P. denticulatum,** (Linn.) Bruch & Schimp. Bryol. Europ.

Hypnum denticulatum, Linn.; Lesq. & James, Mosses of N. America, 367; Canadian Musci, No. 310; Drumm. Musc. Bor.-Am., Nos. 164 and 166.

Upon rocks on the descent of "la grande Côte," in the Rocky Mountains, to the west of the "Height of Land." (*Drummond.*) Pictou Co., N.S. (*McKay.*) Miquelon Island. (*Delamare.*) Cape Charles, Battle Harbor and Deep Water Creek, Labrador. (*Rev. A. Waghorne.*) Bass River, N.B. (*Fowler's Cat.*) Highland Park, N.B. (*Hay.*) On earth at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Bases of trees, Pirate's Cove, Straits of Canso, N.S.; Whycocogmah, Cape Breton; on damp earth and rotten wood, Hunter's River and Brackley Point, Prince Edward Island; on roots of trees in woods, Jupiter River, Anticosti; bases of trees, Gaspé Co., Que.; on bases of trees in McKay's woods, Ottawa; in woods at Britannia, six miles west of Ottawa; on roots of trees, Wooler, Ont.; on earth, Lake Nepigon, Ont.; on the roots of trees, Dawson Route, west of Lake Superior; on damp rocks, and old logs, Roger's Pass, Selkirk Mountains; on earth in bogs, McLeod's Lake, B.C., lat. 55°; on the bases of trees, Deer Park, Lower Arrow Lake; on rotten wood at Hastings, B.C.; wet earth at Victoria, on Mount Arrowsmith, and at Comox, Vancouver Island. (*Macoun.*) In woods at London, Ont. (*J. Dearness.*) Sitka. (*Roth. Alask.*) Greenland. (*Fl. Gr.*) Sitka and Kodiak Island, Alaska, 1891. (*J. M. Macoun.*)

Var. **lætum,** Lesq. & James; Canadian Musci, No. 311.

On the face of perpendicular rocks, six miles north of Otter Head, Lake Superior; on rocks, Lake Nipissing and Lake Nepigon, Ont.; on rocks, near McLeod Lake, B.C., lat. 55. (*Macoun.*)

Var. **squarrosum,** Kindb. Bull. Torr. Bot. Club XVII., 279.

This is a distinct variety presenting a squarrose appearance when dry.

On earth at Hastings, Burrard Inlet, B.C., April 27th, 1889. (*Macoun.*) Attu Island, Behring Sea, 1891. (*J. M. Macoun.*)

(809.) **P. sylvaticum,** Bruch & Schimp. Bryol. Europ.

Hypnum sylvaticum, Huds. ; Lesq. & James, Mosses of N. America, 368 ; Canadian Musci, No. 313.

Vicinity of Quebec. (*St. Cyr.*) On earth at Fredericton, N.B. (*Fowler's Cat.*) On earth at Hunter's River, Prince Edward Island ; on earth by streams, Gaspé Co., Que. ; on earth in damp woods near Belleville and in Dow's swamp, and at Britannia, six miles west of Ottawa ; on earth along Lake Nepigon, Ont. ; on rocks in Roger's Pass, Selkirk Mountains, B.C. ; on stones, mountains north of Griffin Lake, Gold Range, B.C. ; on earth at Yale, B.C. (*Macoun.*) Near London, Ont. (*J. Dearness.*)

(810.) **P. Sullivantiæ,** Schimp. in Bryol. Europ.

Hypnum Sullivantiæ, Schimp. Ms. ; Lesq. & James, Mosses of N. America, 368 ; Canadian Musci, No, 312.
H. silesianum, Drumm. Musc. Bor.-Am., No. 168.

Shady and rocky places ; not rare. (*Drummond.*) On earth, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On rocks at Truro, N.S. (*Fowler's Cat.*) Miquelon Island. (*Delàmare.*) New Harbor, Newfoundland. (*Rev. A. Waghorne.*) On earth by brooks, Truro, N.S. ; on earth at Campbellton, N.B. ; on earth in woods east of Belleville, and on rocks at Leamington, Port Dover, Owen Sound and Lake Nepigon, Ont. ; on wood, Asulcan Glacier, Selkirk Mountains. (*Macoun.*) In woods at London, Ont. (*J. Dearness.*)

(811.) **P. membranosum,** Kindb. (n. sp.)

Rhynchostegium (?) *aneuron*, Kindb. Ott. Nat. IV., 65.

Tufts dense, green and glossy. Leaves distichous, crowded and patent, flat, ovate-oblong, acute or short-acuminate, estriate, entire or denticulate above the middle, decurrent ; cells very long and narrow, the alar large, hyaline and subquadrate ; costa none or obsolete. Capsule cylindric-obovate, horizontally curved ; teeth yellow ; pedicel smooth, 2 cm. long ; lid unknown. Probably diœcious.

On dead wood in Dow's swamp, near Ottawa, October 17th, 1884 ; on old logs at Belleville, Ont., June 19th, 1874. (*Macoun.*)

(812.) **P. brevipungens,** Kindb.

P. auriculatum, Kindb. MS.
Brachythecium brevinerve, Kindb. enum. bryin. exotic.

Tufts dense, dark green. Stems prostrate, irregularly pinnate ; branches attenuate. Leaves crowded, scarcely decurrent, ovate-obloug,

acute or short-pointed, auricled, not plicate nor reflexed on the borders, entire or slightly denticulate at the apex; upper cells long and narrow, the alar very distinct, quadrate, inflate and hyaline; costa very short thick and simple, or none. Capsule curved; lid short, conical; pedicel smooth. Monœcious.

Differs from *P. denticulatum* principally in the smaller crowded leaves and their areolation.

On stones in McKay's woods, Ottawa, Ont., May 21st, 1885. (*Macoun.*)

(813.) **P. aciculari-pungens,** C. M. & Kindb. (n. sp.)

Dicœcious. Tufts dense, radiculose, depressed, glossy green. Stem irregularly divided; branches few and short, not attenuate. Leaves concave, open-erect or patent, decurrent, entire, ovate-oblong with a short needle-shaped, recurved or patent point; margins narrowly recurved below to the middle at one side; areolation uniform and dilated; the angular cells large and not numerous, sub-rectangular; costa none or indistinct. Capsules not found. Habit of *Plagiothecium Sullivantiæ.*

This species is nearly allied to *Plagiothecium sylvaticum,* but the leaves are smaller, the tufts more compact, &c.

On earth, Canaan Forks, Queen's Co., N.B., 1889. (*J. Moser.*)

(814.) **P. undulatum,** Bruch & Schimp. Bryol. Europ.

Hypnum undulatum, Linn.; Lesq. & James, Mosses of N. America, 369; Canadian Musci, No. 314.

Abundant on logs in woods at Hastings, B.C.; also common at Comox, Vancouver Island. (*Macoun.*) On logs, Queen Charlotte Islands; also on logs, Battledown Island, Gulf of Georgia, B.C. (*Dawson.*) Sitka. (*Roth. Alask.*) Sitka and Prince of Wales Island, Alaska, 1891. (*J. M. Macoun.*)

127. AMBLYSTEGIUM, Schimp.

(815.) **A. minutissimum,** (Sulliv. & Lesq.)

Hypnum minutissimum, Sulliv. & Lesq.; Lesq. & James, Mosses of N. America, 371; Canadian Musci, No. 541.

On rocks, North Hastings, Ont.; on earth at the outlet of Lake Louise, Rocky Mountains; also on earth at Revelstoke, Columbia River, B.C. (*Macoun.*)

(816.) **A. Sprucei,** Bruch & Schimp. Bryol. Europ.

Hypnum Sprucei, Bruch & Schimp Ms. ; Lesq. & James, Mosses of N. America, 372 ; Canadian Musci, No. 315.
H. confervoides, Drumm. Musc. Bor.-Am., No. 190.

Shady banks among the Rocky Mountains. (*Drummond.*) On earth, Mount Albert, Gaspé Co., Que. ; on trees in Dow's swamp near Ottawa ; on old stumps in Brighton, Ont. ; on old stumps at Hudson Hope, Peace River, lat. 56° ; on bases of stumps and on earth under rocks at Hector, and on old stumps, Lake Louise, Rocky Mountains ; on earth in woods at Revelstoke, Columbia River, B.C. ; on stumps at Lytton, B.C. ; and on stumps at Nanaimo, Vancouver Island ; on stumps near Lesser Slave Lake, N.W.T. (*Macoun.*) Greenland. (*Fl. Gr.*)

(817.) **A. speirophyllum,** Kindb. Ott. Nat. IV., 64.

Plants loosely cæspitose, dark-green. Stem capillary, irregularly ramulose, not or sparingly radiculose. Leaves small, long-distant, spreading, subcordate or oval-oblong, blunt or sub-acute, entire or denticulate ; cells short ; costa sub-percurrent, broad, sometimes very distinct. Barren. Probably dicœcious. Habit of *Amblystegium Sprucei.*

On rocks at Canaan Forks, Queen's Co., N.B., November, 1889. (*J. Moser.*)

(818.) **A. fenestratum,** Kindb.

A. tenuifolium, Kindb. Ott. Nat. IV., 65.

Plants loosely coherent, green ; stems capillary, irregularly ramulose. Leaves small, spreading, very narrow, ovate-lanceolate, acute, denticulate; cells dilated but elongate ; costa more or less distinct. Barren. Habit of *Amblystegium Sprucei.*

On the borders of a pond near London, Ont., June, 1889. (*J. Dearness.*)

(819.) **A. subtile,** Bruch & Schimp. Bryol. Europ.

Hypnum subtile, Hoffm. ; Lesq. & James, Mosses of N. America, 372 ; Canadian Musci, No. 316 ; Drumm. Musc. Bor.-Am., No. 227.

On the roots of trees in Upper Canada (Ontario) ; at Holland Landing, &c. (*Drummond.*) On the bases of trees in McKay's woods and Dow's swamp, Ottawa ; very abundant also on trees at Owen Sound, Ont. (*Macoun.*)

(820.) **A. confervoides,** Bruch & Schimp. Bryol. Europ.

Hynum confervoides, Brid.; Lesq. & James, Mosses of N. America, 372; Canadian Musci, No. 317.

On stones in woods, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On flat limestone rocks in McKay's woods and in woods west of Ottawa; on limestone boulders in woods around Belleville, Ont.; on flat limestone rocks in woods at Owen Sound, Ont.; also on limestone rocks at Hector, Rocky Mountains. (*Macoun.*)

(821.) **A. Yuratzkæ,** Schimp. Synops. ed. 1.

Hypnum Zuratzskæ, Canadian Musci, No. 466.

On dead wood, stones and bases of trees in damp woods around Ottawa; also on the bases of trees in woods at Owen Sound, Ont.; on old logs west of Revelstoke, B.C. (*Macoun.*)

(822.) **A. serpens,** Bruch & Schimp., Bryol. Europ.

Hypnum serpens, Linn.; Lesq. & James, Mosses of N. America, 373; Canadian Musci, No. 318; Drumm. Musc. Bor.-Am., No. 187.

Roots of trees in shady situations. (*Drummond.*) On earth at the bases of trees at Bass River and Fredericton, N.B. (*Fowler's Cat.*) On earth in woods, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Miquelon Island. (*Delàmare.*) Vicinity of Quebec. (*St. Cyr.*) Battle Harbor, Labrador. (*Rev. A. Waghorne.*) Decayed wood, South-west Point, Anticosti; on earth, Brackley Point, Prince Edward Island; on earth in woods at Ottawa, Belleville, Wooler, Niagara Falls and Owen Sound, Ont.; on roots of trees, Moose Mountain, Assiniboia; on earth at Hudson Hope, Peace River, lat. 56°; abundant at the bases of trees north of Edmonton, N.W.T.; on earth at Quesnel, Spence's Bridge, Sicamous, Kamloops and Agassiz, B.C.; on earth at Cedar Hill, near Victoria, Vancouver Island. (*Macoun*). Near Dorchester, Middlesex Co., Ont. (*J. Dearness.*) Greenland. (*Fl. Gr.*)

Var. **xanthodictyon,** Kindb. (n. var.)

(*A. serpens* * *lutescens,* Kindb. MS.)

Tufts loose, yellow-brown. Stem pinnate. Leaves, from an ovate-oblong base, acuminate, denticulate or entire; the alar and often also the lower basal cells quadrate, yellowish, the other oblong except the inner, sublinear near the costa and in the acumen. Perichetial leaves very small, nerveless.

Although the areolation of the leaves differs very much from the

commoner forms of *Amblystegium serpens*, we dare not propose the present as a distinct species.

On stones along St. Mary's River, Anticosti, August 29th, 1883. (*Macoun.*)

(823.) **A. porphyrhizum,** (Lindb.) Schimp. Synops. muscor. Euro.

Hypnum porphyrhizum, Canadian Musci, No. 319.
H. radicale, Lesq. & James, Mosses of N. America, 373, in part; Drumm. Musc. Bor.-Am., No. 189.

On decaying trees. (*Drummond.*) Fredericton, N.B. (*Fowler's Cat.*) On damp earth, Tobique River, N.B. (*Hay.*) Never's Rapids and Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Miquelon Island. (*Delàmare.*) Fox Harbor, Labrador. (*Rev. A. Waghorne.*) On wet earth and stones, Brackley Point, Prince Edward Island; decayed wood, Pictou, N.S.; wet ground at Campbellton, N.B.; on wet rocks, South-west Point, Anticosti; on stones in woods at Ottawa, also at Carleton Place, Brighton, Belleville and Owen Sound, Ont.; on damp ground, Manitoba House, Lake Manitoba, Man.; on wet logs and rocks at Morley and at Lake Louise, Rocky Mountains; on earth along Lesser Slave Lake, N.W.T. (*Macoun.*) Saskatchewan; and by the Assiniboine at Fort Ellice. (*Bourgeau.*) Pack River, Galton Mountains, B.C. (*Lyall.*) At London, Ont. (*J. Dearness.*)

(824.) **A. varium,** (Hedw.) Lindb.

Hypnum radicale, Lesq. & James, Mosses of N. America, 373, in part; Canadian Musci, No. 320.

Near Fredericton, N.B. (*Prof. Fowler.*) Miquelon Island. (*Delàmare.*) On roots of trees, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On earth at Brackley Point, Prince Edward Island; roots of trees, Gunn River, Anticosti; on stones in McKay's woods, Ottawa; damp ground, Pipestone Creek, and along Lake Winnipegoosis, Man. (*Macoun.*) Saskatchewan. (*Bourgeau.*) Pend d'Oreille River, B.C. (*Lyall.*)

(825.) **A. orthocladon,** (Beauv.) Lesq. & James.

Hypnum orthocladon, Beauv.; Lesq. & James, Mosses of N. America, 374; Canadian Musci, No. 337, in part.

On stones in brooks at Belleville, Ont.; also in brooks and larger streams around Owen Sound, Ont. (*Macoun.*) Kent Co., N.B. (*Fowler's Cat.*) (Pictou Co., N.S. (*McKay.*) ?)

(826.) **A. irriguum,** (Wils.) Bruch & Schimp. Bryol. Europ.

Hypnum irriguum, Lesq. & James, Mosses of N. America, 374.

On wet limestone rocks along the Moira River at Belleville, July 11th, 1878. (*Macoun.*)

Var. **spinifolium,** Lesq. & James ; Canadian Musci, No. 321.

On boulders in the Kaministiquia River, below Kakabeka Falls, west of Lake Superior. (*Macoun.*)

(827.) **A. fluviatile,** Bruch & Schimp. Bryol. Europ. t. 567.

Hypnum fluviatile, Swartz ; Lesq. & James, Mosses of N. America, 375 ; Canadian Musci, No. 446.

On stones in brooks, Queen's Co., N.B. (*J. Moser.*) On rocks, St. John River, Fredericton, N.B. (*Prof. Fowler.*) Blaketown Harbor, Newfoundland. (*Rev. A. Waghorne.*) On rocks in the brook that discharges Kingsmere four miles west of Chelsea, Que. ; on rocks in the Sydenham and other rivers around Owen Sound, Ont. (*Macoun.*) On stones in brooks near London, Ont. (*J. Dearness.*) Near Owen Sound, Ont. (*Mrs. Roy.*) On rocks at Kingston, Ont. (*Prof. Fowler.*)

(828.) **A. curvipes,** Guemb., Bryol. Europ.

On earth in Dow's Swamp, near Ottawa ; on logs, Huntingdon, North Hastings, Ont., July 19th, 1868. (*Macoun.*)

(829.) **A. adnatum,** (Hedw.) Lesq. & James.

Hypnum adnatum, Hedw. ; Lesq. & James, Mosses of N. America, 375 ; Canadian Musci, No. 322, in part.
Hypnum adnatum var., Canadian Musci, No. 323.

On stones in woods, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On flat stones in McKay's Woods, near Ottawa ; also abundant in woods at Brighton, Wooler, Belleville and Owen Sound, Ont. ; at Lake Agnes, Rocky Mountains. (*Macoun.*) On stones at Delaware and London, Ont. (*J. Dearness..*)

(830.) **A. dissitifolium,** Kindb. (n. sp.)

Tufts compact, sparingly radicant, green, not glossy. Leaves very loosely disposed, long-decurrent, ovate-oblong, short-acuminate, denticulate all around ; areolation loose, the upper cells narrower ; the alar larger, quadrate and well distinct, as chlorophyllose as the other cells ; costa percurrent. Inflorescence probably dicœcious ; only male flowers

found. This species is nearly allied to *Amblystegium compactum*, which grows chiefly on decayed wood.

On flat limestone rocks which receive the dripping of water at the falls on the rivers, flowing into the head of Owen Sound Bay; in similar situations near the Whirlpool, Niagara Falls, September 24th, 1890. (*Macoun.*)

(831.) **A. compactum,** (C. Muell.) Bruch & Schimp.

Hypnum compactum, C. Muell.; Lesq. & James, Mosses of N. America, 375.
H.serpens var. *compactum*, Drumm. Musc. Bor.-Am., No. 188.

On the ground in moist places. (*Drummond.*) On the bases of trees, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Bay Bull Arm, Placentia Bay, Newfoundland. (*Rev. A. Waghorne.*) On decayed wood in a swamp at Carleton Place, Ont.; on rocks at Colpoy's Bay, Lake Huron; on rocks, on islands in Lake Nepigon, Ont.; on the tufa mounds at Banff, Rocky Mountains. (*Macoun.*)

(832.) **A. subcompactum,** C. M. & Kindb. (n. sp.)

Hypnum compactum, Canadian Musci, No. 324.

Differs from *Amblystegium compactum* (Drummond, No. 188) in the stems being thicker, the leaves larger and longer, also in the asymmetric capsule, curved in the younger state, at least doubly greater. The British Columbian specimens have a peculiar habit; the tufts are decolorate below, bright green above, the stems are erect, about 2 cm. high.

Growing in thick tufts at the bases of trees around springs and the margins of bogs at Spence's Bridge, Clinton, and along Blackwater River, B.C., June 10th, 1875; on wet rocks near the Whirlpool, Niagara Falls. (*Macoun.*)

(833.) **A. riparium,** (Linn.) Bruch & Schimp. Bryol. Europ.

Hypnum riparium, Linn.; Lesq. & James, Mosses of N. America, 376; Canadian Musci, No. 325; Drumm. Musc. Bor.-Am., No. 170.
H. uncinatum var. *plumosum*, Canadian Musci, No. 374.

About the roots of trees in swamps. (*Drummond.*) Saskatchewan and Rocky Mountains. (*Bourgeau.*) On stones in brooks, Molus River, N.B. (*Fowler's Cat.*) On Kennebecasis Island, N.B. (*Hay.*) Wet places, Norman's Cove, Newfoundland. (*Rev. A. Waghorne.*) On sticks and roots of trees in pools, at Ottawa; on stones in brooks and on rocks and logs in the Moira at Belleville, Ont.; abundant on stones in the rivers and brooks around Owen Sound, and at Red Rock, Lake

Superior, Ont.; in mud at Swan Lake House, Man.; on sticks in pools, Cypress Hills, Alberta; boggy pools, Cave and Basin, Banff, Rocky Mountains; in pools in woods, Lesser Slave Lake, N.W.T.; at Quesnel and Blackwater River, B.C.; on sticks in ponds at Comox, Cedar Hill and Victoria, Vancouver Island. (*Macoun.*) In pools in woods near London, Ont. (*J. Dearness.*) Greenland. (*Fl. Gr.*)

Var. **fluitans,** Lesq. & James; Canadian Musci, No. 326.

Floating in water north shore of Lake Superior; in pools, Thunder Creek, west of Moose Jaw, Assiniboia; in pools at Revelstoke, B.C.; also floating in water at Spence's Bridge, B.C. (*Macoun.*) In pools at London, Ont. (*J. Dearness.*)

(834.) **A. vacillans,** Sulliv.

Hypnum vacillans, Lesq. & James, Mosses of N. America, 377.

Floating in water, marshes of Bay of Quinte, Ont. (*Macoun.*) So named by C. F. Austin.

(835.) **A. distantifolium,** Kindb. (n. sp.)

Stems irregularly branching, creeping. Leaves green, distant, spreading when dry, patent when moist, long ovate-lanceolate, long-cuspidate, not or indistinctly decurrent, sharply serrulate all around, chlorophyllose; cells wide, suboblong; costa thick percurrent or nearly excurrent. Barren.

Differs from *A. serpens* in the leaves being longer cuspidate and the thick, very much longer costa.

On rocks, Chance Cove and New Harbor, Newfoundland, August 16th, 1890. (*Rev. A. Waghorne.*)

Obs. **A. Wollei,** (Aust.) Kindb. is.

No. 644 Leskea Wollei, Aust.

128. HYPNUM, LINN.

Subgenus I. CAMPYLIUM, Linn.

(836.) **H. hispidulum,** Brid.; Lesq. & James, Mosses of N. America, 378; Canadian Musci, No. 327.

Mooyie River, B.C. (*Lyall.*) Bass River, also Little Branch, Miramichi, N.B. (*Fowler's Cat.*) On the bases of trees, Canaan Forks, Queen's Co., and Elmwood, King's Co., N.B. (*J. Moser.*) On earth at

Truro, N.S.; on decayed wood at Campbellton, N.B.; roots of trees in shady woods, Gaspé Co., Que., not rare; on the bases of trees in woods around Ottawa; on earth at Carleton Place, near Ottawa; on old logs at Belleville and on the bases of trees, Brighton and Owen Sound, Ont.; on old logs at Lake Nipissing and Lake Nepigon, Ont.; decayed wood, Cypress Hills, Alberta; on earth at the bases of trees at Quesnel and Hastings, B.C. (*Macoun.*) At London, Ont. (*J. Dearness.*)

(837.) **H. byssirameum,** C. M. & Kindb. (n. sp.)

Resembling a small form of *H. Sommerfeltii*, Myr., but the leaves are denticulate all around. Barren.

On the base of a dead tree in William Valentine's woods, Brighton, Northumberland Co., Ont., October 5th, 1888. (*Macoun.*)

(838.) **H. Sommerfeltii,** Myrin; Canadian Musci, 328.

H. stellatum var. *polymorphum*, Drumm. Musc. Bor.-Am., No. 186.

On old logs, Never's Rapids, Queen's Co., N.B. (*J. Moser.*) Salmon River, Kent Co., N.B. (*Fowler's Cat.*) On logs at Belleville, Ont.; on the bases of trees at Ottawa; on the bases of trees at Leamington, Ont.; also on damp rocks at Sydenham Falls, Owen Sound, Ont.; on wet rocks, Kakabeka Falls, west of Fort William, Lake Superior; on the roots of trees along Peace River, lat. 56°; on earth along the Columbia River at Revelstoke, on logs at Quesnel, B.C.; also on mountains north of Griffin Lake and at Hastings, B.C. (*Macoun.*) In woods at Kingston, Ont. (*Prof. Fowler.*) Dripping rocks. (*Drummond.*)

(839.) **H. chrysophyllum,** Brid.; Lesq. & James, Mosses of N. America, 378; Canadian Musci, No. 329.

H. stellatum var. *chrysophyllum*, Drumm. Musc. Bor.-Am., No. 185.

About gravelly, springy places. (*Drummond.*) Bay Bull Arm, Placentia Bay, Newfoundland. (*Rev. A. Waghorne.*) On logs, Tobique River, N.B. (*Hay.*) On earth, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Pictou Co., N.S. (*McKay.*) On rocks along Ste. Anne des Monts River, Gaspé Co., Que.; on roots of trees in woods at Ottawa, and Carleton Place; on old logs in wet woods east of Belleville, Ont.; on stones in woods at Owen Sound, Ont.; on rocks, Lake Nepigon, Ont.; on roots of trees, Manitoba House, Man.; damp rocks in wet woods at Morley, Rocky Mountains; in swamps at Sicamous and Port Haney, Fraser River, B.C. (*Macoun.*) Near London, Ont. (*J. Dearness.*) Saskatchewan. (*Bourgeau.*)

(840.) **H. unicostatum,** C. M. & Kindb. (n. sp.); Canadian Musci, No. 590.

Differs from *Hypnum chrysophyllum* in the dense tufts, the stem more irregularly branching, creeping, the leaves shorter-acuminate, the alar cells smaller, not yellow, the costa more distinct, the capsule smaller, the perichetial leaves gradually acuminate-subulate or filiform-pointed with the acumen arcuate.

At Canaan Forks, Queen's Co., N.B. (*J. Moser.*) In the Mer Bleue near Ottawa, October 4th, 1890. (*Macoun.*) At Cataraqui, near Kingston, Ont., May 23rd, 1884. (*Prof. Fowler.*)

(841.) **H. decursivulum,** C. M. & Kindb. (n. sp.); Canadian Musci, No. 514.

H. Sommerfeltii, Canadian Musci, No. 328, in part.

Differs from *Hypnum chrysophyllum* in the leaves being decurrent with a broader base, borders recurved at the angles; alar cells numerous, hyaline. Barren.

Abundant on old logs in a boggy place under the trestle just east of of Albert Cañon Station, Selkirk Mountains, B.C., May 29th, 1890. (*Macoun.*) Near New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

(842.) **H. Columbiæ,** Kindb.

Amblystegium serpens' Columbiæ, Kindb. Bull. Torr. Bot. Club. XVII. 279.

Tufts dense. Stems short, very tomentose, irregularly branching; branches short. Leaves narrower than in *Hypnum chrysophyllum*, from the narrow-ovate base gradually tapering into the acumen; borders denticulate all around, recurved at the angles; areolation often wide, as in *Amblystegium;* costa short, reaching to the acumen or sometimes longer. Capsule generally smaller and shorter than in *H. chrysophyllum*, curved; lid short-apiculate; peristome dark-yellow, not pale; perichetial leaves short-acuminate.

Differs from *H. chrysophyllum* in the narrower, denticulate leaves, from *H. hispidulum* and *H. Sommerfeltii* in the long costa.

On wet logs near a spring about one mile from Sicamous, B.C., on the road to Enderby, July 19th, 1889. (*Macoun.*)

(843.) **H. Macounii,** Kindb. Bull. Torr. Bot. Club, XVII., 279; Canadian Musci, No. 522.

H. Halleri, Drumm. Musc. Bor.-Am., No. 191.

Allied to *Hypnum hispidulum.* Habit of the European *H. Halleri.* Monœcious. Plants small, interlaced in dense brownish-green tufts.

Stems pinnate, prostrate, sparingly radiculose. Leaves densely crowded, squarrose-recurved, round-deltoid, short-acuminate, reflexed on the borders of the entire base to the denticulate acumen ; alar cells quadrate, pellucid. not numerous, the other short-oblong or short-lanceolate ; costa obsolete or none. Capsule small, narrow-cylindrical, slightly curved, annulus simple ; basilar membrane low ; lid convex, obtuse and not apiculate ; pedicel reddish-brown, smooth, 2 c.m. long.

On earth by springs at Mount Stephen, also abundant forming thin mats on flat stones at Hector and on the slopes of Cathedral Mountain, Rocky Mountains, alt. 5,600 feet. (*Macoun.*) Rocks about the Portage River, in the Rocky Mountains. (*Drummond.*)

(844.) **H. stellatum,** Schreb.; Lesq. & James, Mosses of N. America, 379 ; Canadian Musci, No. 330.

Nottingham Island, Hudson Strait. (*R. Bell.*) Miquelon Island. (*Delàmare.*) New Harbor, Newfoundland, and Fox Harbor, Labrador (*Rev. A. Waghorne.*) On earth in bogs and swamps at Gunn River and Becscie River, Anticosti ; on earth in a meadow, Gaspé Co., Que. ; beaver meadow, Lake Nipissing ; on boggy soil at Current River and Mamainse, Lake Superior ; peaty meadow, Porcupine Mountains, Man. ; in swamps at Morley and Stephen, Rocky Mountains ; in bogs near Fort Assiniboine, Athabasca River ; in a limestone spring, Sicamous, B.C. ; also on the mountains north of Griffin Lake, Gold Range, B.C (*Macoun.*) Greenland. (*Fl. Gr.*) In swamps at London, Ont. (*J. Dearness.*)

Var. **protensum,** Bruch & Schimp. ; Canadian Musci, No. 331.

In beaver meadows, Huntingdon, Hastings Co., Ont. ; also in swampy meadows at Stephen and Morley, Rocky Mountains ; in limestone springs, shore of Lake Mara, near Sicamous, B.C. (*Macoun.*)

Var. **subdecursivulum,** Kindb. (n. var.)

Leaves smaller, decurrent, abruptly acuminate from a short-ovate base ; alar cells more numerous. Not found fruiting.

Amongst *Dicranum scoparium* on earth by springs in a swamp near Brighton, Northumberland Co., Ont., October 5th, 1888. (*Macoun.*)

(845.) **H. polygamum,** Wils. ; Lesq. & James, Mosses of N. America, 379.

H. stellatum, Drumm. Musc. Bor.-Am., No. 184.

Swamps ; not frequent. (*Drummond.*) In the "Big Swamp," Murray, Northumberland Co., Ont. ; on earth in the valley of the Thompson

River at Kamloops, B.C. (*Macoun.*) Greenland. (*Fl. Gr.*) Miquelon Island. (*Delàmare.*) At New Harbor, White Bay and Blaketown, Newfoundland, and at Battle Harbor and Fox Harbor, Labrador. (*Rev. A. Waghorne.*) At Canaan Forks, Queen's Co., N.B. (*J. Moser.*)

Subgenus. II. HARPIDIUM, Sulliv.

(846.) **H. Kneiffii,** (Bruch & Schimp.)

Hypnum aduncum var. *Kneiffii*, Schimp. ; Lesq. & James, Mosses of N. America, 380 ; Canadian Musci, No. 333.
Hypnum aduncum, Canadian Musci, No. 332.

Battle Harbor, Labrador. (*Rev. A. Waghorne.*) In swamps, Queen's Co., N.B. (*J. Moser.*) In pools, Mount Albert, Gaspé Co., Que. ; in swamps at Beechwood, and in Dow's Swamp, Ottawa ; in a bog at Britannia, six miles west of Ottawa ; wet springy places at Belleville and Wooler, Ont. ; springs at Morley, Rocky Mountains ; in swamps, Peace River, lat. 56° ; in swamps at Revelstoke and at Quesnel, B.C. (*Macoun.*) Rocky Mountains. (*Lyall.*) Saskatchewan. (*Bourgeau.*) Greenland. (*Fl. Gr.*) Shore of Lake Erie, Ont. (*J. Dearness.*)

Var. **gracilescens,** Bruch & Schimp.; Canadian Musci, No. 447.

In a limestone spring at Sicamous, B C. (*Macoun.*)

Var. **laxum,** Kindb. (n. var.)

In Dow's swamp near Ottawa, October 10th, 1884. (*Macoun.*)

Var. **rectifolium,** Kindb. (n. var.)

On damp rocks, in McKay's woods at Ottawa, August 26th, 1889. (*Macoun.*)

Var. **platyphyllum,** Kindb. (n. var.)

Leaves very broad and short-acuminate.
On damp rocks in woods at Rockcliff, near Ottawa, September 10th, 1889. (*Macoun.*)

(847.) **H. Sendtneri,** Schimp. ; Lesq. & James, Mosses of N. America, 381 ; Canadian Musci, No. 384, in part.

Broad Cove, Newfoundland. (*Rev. A. Waghorne.*) In bogs at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) In water in Dow's swamp, near Ottawa ; in water in marshes, Hastings Co., Ont. ; in

bogs, Porcupine Mountains, Man.; in springs at Morley, Rocky Mountains; in limestone springs at Sicamous, B.C. (*Macoun.*)

(848.) **H. Cossoni,** Schimp.; Canadian Musci, No. 338.

H. revolvens var. *intermedium*, Lesq. & James, Mosses of N. America, 384.
H. intermedium, Lindb.

Very abundant in crevices of wet rocks along the north and east coasts of Lake Superior; around springs at Morley, and in bogs at Lake Louise, Rocky Mountains. (*Macoun.*) Greenland. (*Fl. Gr.*)

(849.) **H. vernicosum,** Lindb.; Lesq. & James, Mosses of N. America, 385; Canadian Musci, No. 384.

H. aduncum, Drumm. Musc. Bor.-Am., No. 201.

Common in marshes and swamps. (*Drummond.*) In bogs at Jupiter, Becscie and Gunn rivers, Anticosti; in bogs at Tignish, Prince Edward Island; bogs north of Lake Superior; bogs west of the Saskatchewan River, N.W.T.; on wet rocks and in bogs at Hector, Rocky Mountains; in bogs at Quesnel, B.C.; in bogs on Mount Benson, Vancouver Island. (*Macoun.*) Pack River, B.C. (*Lyall.*) Greenland. (*Fl. Gr.*)

(850.) **H. Wilsoni,** Schimp.

Greenland. (*Fl. Gr.*)

(851.) **H. brevifolium,** Lindb. Spitzberg. Moss. 541.

Greenland. (*Fl. Gr.*)

(852.) **H. lycopodioides,** Schwaegr.; Lesq. & James, Mosses of N. America, 385.

Greenland. (*Fl. Gr.*) Miquelon Island. (*Delàmare.*)

(853.) **H. revolvens,** Swartz; Lesq. & James, Mosses of N. America, 384; Canadian Musci, No. 387.

Battle Harbor and Squaw Island, Labrador. (*Rev. A. Waghorne.*) Cedar swamp two miles west of Ste. Anne des Monts, Gaspé Co., Que. (*J. A. Allen.*) In bogs at Salt Lake, Anticosti; swamps along Lake Nepigon; in swamps at Red Rock, Lake Superior; in a marsh at Banff, Rocky Mountains. (*Macoun.*) Alaska. (*Harrington.*) Greenland. (*Fl. Gr.*)

(854.) **H. fluitans,** Linn.; Lesq. & James, Mosses of N. America, 383; Canadian Musci, No. 336, in part.

H. fluitans var. *foliis minoribus,* Drumm. Musc. Bor.-Am., Nos. 203 and 204.

Swamps; not uncommon at Carlton House (No. 204). Common in marshes (No. 203). (*Drummond.*) In bogs, Coldbrook, N.B. (*Hay.*) Miquelon Island. (*Delàmare.*) New Harbor, Newfoundland, and Fox Harbor, Labrador. (*Rev. A. Waghorne.*) In boggy places at Brackley Point, Prince Edward Island; in peat bogs, North-west Arm, Halifax, N.S.; peat bogs, Salt Lake and Becscie River, Anticosti; in a swamp west of Hull, Que.; boggy places, McKay's woods, Ottawa; in pools on rocks, Michipicotin Island, Lake Superior; in pools, in Roger's Pass, Selkirk Mountains; also in bogs in Eagle Pass, west of Revelstoke, Columbia valley, B.C. (*Macoun.*) Peat bogs, Belvin's Lake, Que. (*D'Urban.*) Greenland. (*Fl. Gr.*)

(855.) **H. exannulatum.** Guembel; Lesq. & James, Mosses of N. America, 384; Canadian Musci, No. 382.

In boggy places, Bass River, N.B. (*Fowler's Cat.*) In swamps, Queen's Co., and Elmwood, King's Co., N.B. (*J. Moser.*) In boggy soil, Cape Chudleigh, Hudson Strait. (*R. Bell.*) Miquelon Island. (*Delàmare.*) Chance Cove, and Harbor Deep, Newfoundland; Battle Harbor, Indian Harbor and Seal Islands, Labrador. (*Rev. A. Waghorne.*) In bog-holes and ponds, frequent, Prince Edward Island; in pools of water, Roger's Pass, Selkirk Mountains, B.C.; in small ponds near perpetual snow, Gold Range, north of Griffin Lake, B.C.; common in pools at Sicamous, B.C. (*Macoun.*) North Dorchester, near London, Ont. (*J. Dearness.*) Greenland. (*Fl. Gr.*)

(856.) **H. uncinatum,** Hedw.; Lesq. & James, Mosses of N. America, 382; Canadian Musci, No. 335; Drumm. Musc. Bor.-Am., No. 202.

Woods and banks amongst the Rocky Mountains. (*Drummond.*) Cape Cudleigh, Hudson Strait. (*R. Bell.*) Squaw Island, Seal Islands and Battle Harbor, Labrador and New Harbor, Newfoundland. (*Rev. A. Waghorne.*) On the ground at Bass River, Fredericton and Little Branch, Miramichi, N.B. (*Fowler's Cat.*) On earth, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Miquelon Island. (*Delàmare.*) River Sheldrake, Que. (*St. Cyr.*) Pictou Co., N.S. (*McKay.*) On earth at Hunter's River and Brackley Point, Prince Edward Island; on earth at Truro, N.S.; common in wet places, Salt Lake, Anticosti; very common on earth, Mount Albert and other parts of Gaspé, Co.,

Que.; common in wet woods at Beechwood, Dow's swamp and Mer Bleue, near Ottawa; abundant throughout Ontario and at Lake Superior, Lake Nipissing and Lake Nepigon; common in swamps at Hector and Banff, Rocky Mountains; in Roger's Pass, Selkirk Mountains; on earth in woods along the Columbia River at Revelstoke, also at Sicamous, and on the Gold Range at Griffin Lake and Hastings, Burrard Inlet, B.C. (*Macoun.*) Near London, Ont. (*J. Dearness.*) In bogs, Punk Island, Lake Winnipeg; Cape Vancouver and St. Paul Island, Behring Sea, 1891. (*J. M. Macoun.*) Cascade, Galton and Rocky Mountains, B.C. (*Lyall.*) Rocky Mountains. (*Bourgeau.*) Kotzebue Sound. (*Roth. Alask.*) Greenland. (*Fl. Gr.*) Very common across the continent.

Var. **plumosum,** Schimp.; Canadian Musci, No. 374.

On rocks, Gaspé Co., Que.; and bases of trees, Lake Nepigon, Ont.; along Kicking Horse Lake, Rocky Mountains. (*Macoun.*)

Var. **subestriatum,** Kindb.; Canadian Musci, No. 376.

Leaves nearly estriate.

On earth at Hunter's River, Brackley Point and Cove Head, Prince Edward Island; on earth at Revelstoke, Columbia River, B.C. (*Macoun.*)

Var. **micropterum,** Kindb. (n. var.)

Stems nearly simple; leaves long-cuspidate, not striate above, alar cells small; inflorescence probably dicœcious; only female flowers found.

Battle Harbor, Labrador, August 30th, 1891. (*Rev. A. Waghorne.*)

* **H. orthothecioides,** Lindb. Spitzberg. Moss.

Amongst other mosses at Battle Harbor, Labrador. (*Rev. A. Waghorne.*)

(857.) **H. Moseri,** Kindb. Ott. Nat. IV. 65.

Differing from *H. uncinatum* in the leaves not being striate, but sometimes recurved at the base; costa faint, often failing; differing from all other *Harpidia* in the stem being densely radiculose.

On the bases and trunks of poplar trees in woods at Canaan Forks, Queen's Co., N.B., December 30th, 1889. (*J. Moser.*) New Harbor, Freshwater, and Chance Cove, Newfoundland. (*Rev. A. Waghorne.*)

(858.) **H. longinerve,** Kindb.

Dichelyma longinerve, Kindb., Bull. Torr. Bot. Club. XVI., 97 ; Canadian Musci, No. 391.

Habit of *Hypnum fluitans.* Stems erect, about 1 decim. high, loosely cæspitose, rootless, subpinnately branching. Leaves falcate, entire, the upper yellowish-green, oval-lanceolate, long-acuminate, long-pointed by the $\frac{1}{4}$–$\frac{1}{2}$ excurrent costa ; most of the cells sub-linear, the basal numerous, in 4–6 rows, subquadrate or rectangular, the alar greater, pellucid. Flowers and capsules not seen.

Quite common on sticks in dried-up ponds, particularly behind the school-house, at Cedar Hill, near Victoria, Vancouver Island, June 23rd, 1887. (*Macoun.*)

(859.) **H. conflatum,** C. M. & Kindb. (n. sp.)

H. Sendtneri, Canadian Musci, No. 334, in part.
H. fluitans, Canadian Musci, No. 336, in part.

Allied to *Hypnum Kneiffii.* Stem slender, subfiliform, distantly pinnate, not radiculose. Leaves small, concave, distant, denticulate all around ; stem-leaves decurrent, from a broad-ovate base suddenly narrowed into a very short, subulate-filiform, straight point ; alar cells very large, hyaline or faintly yellowish, the other nearly uniform, oblong-lanceolate, conflate ; costa pale-yellow, vanishing in the acumen ; branch-leaves narrower, oblong-lanceolate, more or less short-acuminate, curved or straight. Capsule very small, arcuate and contracted below the mouth. Dicœcious.

In a pool on the mountain between the Thompson and Nicola rivers at Spence's Bridge, B.C. ; alt. 3,000 feet, May 28th, 1889 ; also in a bog at Britannia, six miles west of Ottawa, Ont. (*Macoun.*) Battle Harbor, Labrador. (*Rev. A. Waghorne.*)

Subgenus III. CRATONEURON, Sulliv.

(860.) **H. filicinum,** Linn. ; Lesq. & James, Mosses of N. America, 386 ; Canadian Musci, No. 339.

By springs, Tobique River, N.B. (*Hay.*) New Harbor and White Bay, Newfoundland. (*Rev. A. Waghorne.*) By a spring at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) In limestone springs, Jupiter River, Anticosti ; by springs, at Truro, N.S. ; wet limestone rocks and by springs, Gaspé Co., Que. ; by a spring along the Trent River, two miles above the railway bridge at Trenton, Ont. ; abundant on rocks below Jones Falls, at Owen Sound, Ont. ; by springs along the Atha-

basca River, Fort Assiniboine, N.W.T.; in limestone springs at Hudson Hope, Peace River, lat. 56°; on the tufa mounds and in springs at Banff, Rocky Mountains; on stones in a brook at Spence's Bridge, B.C.; and at Comox Vancouver Island. (*Macoun.*) Saskatchewan. (*Bourgeau.*) Mooyie River, B.C. (*Lyall.*) In the vicinity of London, Ont. (*J. Dearness.*)

Var. **aciculinum,** C. M. & Kindb. (n. var.)

Costa excurrent to a rigid point. On wet rocks in Eagle Pass west of Revelstoke, B.C., May 23rd, 1890. (*Macoun.*)

(861.) **H. chloropterum,** C. M. & Kindb. (n. sp.)

H. (*Brachythecium*) *Novæ-Angliæ,* Canadian Musci, No. 440.

Tufts laxly cohering, with few rhizoids, whitish or bright green, not shining. Stem more or less densely pinnate, rigid. Stem-leaves small, patent also in a dry state, loosely and long-decurrent, auricled, papillose at back, distinctly but faintly plicate, concave, broad-ovate, suddenly narrowed to a short, in a dry state, twisted acumen; borders broadly recurved below, sometimes to the middle, denticulate all around from the apex to the auricles; areolation lax, more or less chlorophyllose; alar cells larger, subquadrate, numerous, the other oval-oblong, only the uppermost narrow; costa distinct, reaching above the middle; branch-leaves more loosely disposed, sometimes ovate-oblong and narrow-areolate. Capsule small, suboblong, straight or curved; lid elongate-conic, oblique-apiculate or rostellate; pedicel 1–1.5 cm. long, very rough, purple. Inner perichetial leaves narrower, longer filiform-pointed, nerveless. Monœcious.

This species resembles *Hypnum Novæ-Angliæ* in habit, but differs considerably in the distinctly papillose, looser and patent, wider-areolate leaves and the monœcious inflorescence. In *Hypnum Novæ-Angliæ,* the branches are julaceous and the leaves nearly appressed in a dry state, the branchlets shorter and less evolute. Both have a wide leaf-areolation, resembling the allied *Hypnum filicinum* and *Hypnum commutatum,* also the genus *Amblystegium.*

On rocks, New Harbor, Newfoundland. (*Rev. A. Waghorne.*) On the ground in shade, Canaan Forks, Queen's Co., and Elmwood, King's Co., N.B. (*J. Moser.*)

(862.) **H. Novæ-Angliæ,** Sulliv. & Lesq.; Lesq. & James, Mosses of N. America, 344.

On earth in woods at Canaan Forks, Queen's Co., N.B. (*J. Moser.*)

(863.) **H. commutatum,** Hedw.; Lesq. & James, Mosses of N. America, 387; Canadian Musci, No. 448.

Rocky Mountains. (*Bourgeau.*) On earth in a swamp, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On wet rocks, North Hastings, Ont.; on rocks at Hastings, Burrard Inlet, B.C. (*Macoun.*) Greenland. (*Fl. Gr.*)

(864.) **H. falcatum,** Brid. Musc. Recent. III., 63; Canadian Musci, No. 340.

H. commutatum var. *falcatum*, C. Muell.; Lesq. & James, Mosses of N. America, 387,

Come by Chance Cove, Newfoundland; and Bolster Rocks, Labrador. (*Rev. A. Waghorne.*) Abundant in bogs and on dripping rocks at Hector and Stephen, Rocky Mountains; on dripping rocks in Eagle Pass, west of Revelstoke, Columbia River, B.C.; on stones along the springy margin of the west side of Lake Mara, near Sicamous, B.C. (*Macoun.*) On the summit of Mount Queest, Gold Range, B.C.; alt. 7,000 feet. (*J. M. Macoun.*)

Var. **microphyllum,** Kindb. (n. var.)

Stem leaves very small and entire; alar cells small; stem irregularly divided, without paraphyllia, with none, or few rhizoids. Barren.

Bay Bull Arm, and Broad Cove, Placentia Bay, also Blaketown and New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

(865.) **H. decipiens,** (De Not.). Kindb.

Thuidium decipiens, De Not.; Canadian Musci, No. 545.

Allied to *Hypnum falcatum*, *H. commutatum* and *H. filicinum*; it is distinct principally in the very papillose, not striate leaves and short cells, the alar hyaline.

On calcareous rocks at Hector, Rocky Mountains; on stones in brooks, Roger's Pass, Selkirk Mountains, B.C.; on wet rocks, Nanaimo River, below the railway bridge, near Nanaimo, Vancouver Island. (*Macoun.*)

Subgenus IV. RHYTIDIUM, Sulliv.

(866.) **H. rugosum,** Linn.; Lesq. & James, Mosses of N. America, 388; Canadian Musci, No. 341.

H. rugulosum, Drumm. Musc. Bor.-Am., No. 198.
Rhytidium rugosum Kindb. Laubm. Schwd. u. Norveg.

Lake Superior; in fructification at Beaver Lake; rare. (*Drummond.*) On dry rocks, Kakabeka Falls, 30 miles west of Fort William,

Lake Superior. (*Mrs. E. G. Britton.*) On dry rocks, near Current River, north of Port Arthur, Lake Superior; also on rocks along Nepigon River, Ont.; on rocks, "Dry Cañon," discharge of Devil's Lake, and on rocks at Morley, foothills of Rocky Mountains; also on the banks of Peace River at the mouth of Smoky River, lat. 56° 30′. (*Macoun.*) Little Bay Islands, Labrador. (*Rev. A. Waghorne.*) Greenland. (*Fl. Gr.*)

Subgenus V. CTENIUM, Sulliv.

(867.) **H. crista-castrensis,** Linn.; Lesq. & James, Mosses of N. America, 389; Canadian Musci, No. 343; Drumm. Musc. Bor.-Am., No. 212.

In moist shady woods; abundant. (*Drummond.*) Miquelon Island. (*Delàmare.*) Pictou Co., N.S. (*McKay.*) River du Loup (*en bas*), Que. (*St. Cyr.*) Deep-water Creek, Labrador; and Come by Chance and Coachman's Cove, Newfoundland. (*Rev. A. Waghorne.*) On old logs; common, New Brunswick. (*Fowler's Cat.*) On logs, Tobique River, N.B. (*Hay.*) On old logs, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Pine woods, River Rouge, Argenteuil Co., Que. (*D'Urban.*) On logs in swamps at Truro, N.S.; common on logs at Brackley Point, Prince Edward Island; damp woods, Jupiter River, Anticosti; on logs in woods, Gaspé Co., Que.; on old logs in damp woods around Ottawa; abundant in damp woods at Belleville and Lake Nepigon, Ont.; old logs in woods, Manitoba House, Man.; in woods near Lesser Slave Lake, N.W.T.; on old logs, Morley, Rocky Mountains; on logs in Roger's Pass and Albert Cañon, Selkirk Mountains, B.C.; wet woods at Sicamous, B.C. (*Macoun.*) Saskatchewan. (*Bourgeau.*)

Subgenus VI. CTENIDIUM, Mitt.

(868.) **H. molluscum,** Hedw.; Lesq. & James, Mosses of N. America, 389; Canadian Musci, No. 344.

Pictou Co., N.S. (*McKay.*) On logs, Tobique River, N.B. (*Hay.*) On rotten logs, Hunter's River, Prince Edward Island; on shaded rocks, Ste. Anne des Monts River, Gaspé Co., Que.; on old logs in Dow's swamp, near Ottawa. (*Macoun.*) Bay Bull Arm, Placentia Bay, and Green Harbor, Newfoundland. (*Rev. A. Waghorne.*)

Subgenus VII. DREPANIUM, C. Muell.

(869.) **H. reptile,** Michx.; Lesq. & James, Mosses of N. America, 390; Canadian Musci, No. 345.

H. cupressiforme foliis angustioribus, Drumm. Musc. Bor.-Am., Nos. 206 and 207.

Rocks and trunks of trees; not rare (206); trunks of trees and rocks; not uncommon (207). (*Drummond.*) Miquelon Island. (*Delàmare.*) Pictou Co., N.S. (*McKay.*) Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Bass River, Fredericton, and Grand Lake, N.B. (*Fowler's Cat.*) On trees near Halifax, N.S.; on bases of trees, Brackley Point, Prince Edward Island; trunks of trees, Gaspé Co., Que.; abundant on trunks of trees at Ottawa; very common on trunks at Belleville, Ont.; also at Lake Nipissing and Lake Nepigon, Ont.; on trees, Dawson Route, west of Lake Superior; on trees, Athabasca River, near Fort Assiniboine, N.W.T.; on bases of trees at Manitoba House, Man. (*Macoun.*) On trunks at Punk Island and other points, Lake Winnipeg; Clear water River, N.W.T., lat. 57°. (*J. M. Macoun.*) Kootanie River, B.C. (*Lyall.*) Vicinity of London, Ont. (*J. Dearness.*)

(870.) **H. pallescens,** Schimp. Syn. ed. 2.

On limestone rocks on an old stone fence along the Aylmer Road, west of Hull, Que., October 24th, 1891. (*Macoun.*) Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Confounded with H. reptile.

(871.) **H. fertile,** Sendt.; Lesq. & James, Mosses of N. America, 391; Canadian Musci, No. 346, in part.

On old logs, Bass River, N.B. (*Fowler's Cat.*) On logs at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On logs, Tobique River, N.B. (*Hay.*) Baie St. Paul, Charlevoix Co., Que. (*St. Cyr.*) Decayed logs, Belvin's Lake, Que. (*D'Urban.*) On logs, Jupiter River, Anticosti; on logs, Gaspé Basin, and along the Gaspé coast, Que.; on old logs in woods at Owen Sound, Ont. (*Macoun.*) Islands in the Gulf of Georgia, B.C. (*Dawson.*) All the above localities doubtful except the last, as the specimens have not been examined by Kindberg.

(872.) **H. Waghornei,** Kindb. (n. sp.)

Differs from *H. fertile* in the large and hyaline alar leaf-cells, the other basal ones not yellow, capsule tumid at the base, slightly curved, paraphyllia very broad.

New Harbor and Chance Cove, Newfoundland, September 26th, 1890. (*Rev. A. Waghorne.*)

(873.) **H. fastigiatum,** Brid.

On dry rocks at Hector (Kicking Horse Lake) Rocky Mountains, and on large boulders three miles to the west, July, 1885, and August, 1890. (*Macoun.*) Greenland. (*Fl. Gr.*)

(874.) **H. hamulosum,** Bruch & Schimp. ; Lesq. & James, Mosses of N. America, 391 ; Canadian Musci, No. 393.

H. cupressiforme, Drumm. Musc. Bor.-Am., No. 205.

Upon rocks, about Beaver Lake. (*Drummond.*) Along Ste. Mary's River, Anticosti. (*Macoun.*) Greenland. (*Fl. Gr.*) Blaketown and Hopewell Bay, Newfoundland ; Battle Harbor and Deep Water Bay, Labrador. (*Rev. A. Waghorne.*)

(875.) **H. pseudo-fastigiatum,** C. M. & Kindb. (n. sp.)

Allied to *Hypnum reptile,* differing principally in the alar leaf-cells being more numerous, chlorophyllose and dusky, not decolorate, the capsule scarcely contracted below the mouth, the perichetial leaves nerveless.

On the bases of trees in woods in the Columbia River valley, west of Revelstoke, B.C., May 6th, 1890 ; also on rocks at Owen Sound, Ont. (*Macoun.*)

(876.) **H. circinnale,** Hook. ; Lesq. & James, Mosses of N. America. 392 ; Canadian Musci, No. 347, in part.

Vancouver Island. (*Lyall.*) On old logs, in woods at Hastings, Burrard Inlet, B.C. ; also on old logs at Victoria, Vancouver Island. (*Macoun.*) Kotzebue Sound, Nulato and Alaska. (*Roth. Alask.*)

(877.) **H. Sequoieti,** C. Muell. ; Lesq. & James, Mosses of N. America, 392.

H. circinale, Canadian Musci, No. 347, in part.

Freshwater, Chance Cove, Newfoundland. (*Rev. A. Waghorne.*) On trunks of trees at Revelstoke, Columbia River, B.C. ; on trunks, Mount Benson, near Nanaimo, and at Comox, Vancouver Island. (*Macoun.*) On trunks, Melaspina Inlet, Gulf of Georgia, B.C. (*Dawson.*) Sitka, Alaska ; and at Port Essington, B.C., 1891. (*J. M. Macoun.*)

(878.) **H. callichroum,** Brid. ; Lesq. & James, Mosses of N. America, 392.

Shelburne, Nova Scotia. (*James.*) Greenland. (*Fl. Gr.*)

(879.) **H. Canadense,** Kindb. Bull. Torr. Bot, Club, XVII., 280.

Intermediate between *H. imponens* and *H. subimponens.* Dicœcious. Densely cæspitose, yellow or pale-green. Stems creeping, densely pinnate-ramulose; branches robust, thick and tumid. Leaves close, falcate, with elongate-ovate or oblong base and short acumen, faintly or not striate, more or less denticulate all around, not reflexed on the borders, larger than in *H. imponens;* cells very narrow, the alar (one or two) large and pellucid, the other basal cells yellow; paraphyllia few, subulate. Perigonial leaves very broad-ovate, abruptly narrowed to a straight subulate point. Capsule obovate, asymetric or subcylindric and arcuate, thick and not striate; teeth yellow, segments orange, cilia short and not appendiculate; pedicel 4-5 cm. long; upper perichetial leaves erect. This species seems to be confounded with *H. imponens.*

St. John's and Hopewell Bay, Bay Bull Arm and White Bay, Newfoundland. (*Rev. A. Waghorne.*) On stones, McNab Island, Halifax Harbor, N.S.; on rotten logs at the summit level of the Canadian Pacific Railway, near Hector, Rocky Mountains, alt. 5,300 feet; on old logs at Leamington, Lake Erie, and at Rockcliffe, Ottawa, Ont.; on stones in woods at Hull, Que. (*Macoun.*) Prince of Wales Island, Alaska, 1891. (*J. M. Macoun.*)

(880.) **H. imponens,** Hedw.; Lesq. & James, Mosses of N. America, 393; Canadian Musci, No. 348.

Miquelon Island. (*Delàmare.*) Pictou Co., N.S. (*McKay.*) Old logs, Canaan Forks, N.B. (*J. Moser.*) Bay Bull Arm, Placentia Bay, and New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Old logs, Pirate's Cove, Straits of Canso, N.S.; common on rotten logs at Ottawa; abundant in woods at Belleville, Ont.; on old logs at Hastings, B.C.; and on Mount Arrowsmith, Vancouver Island. (*Macoun.*)

(881.) **H. subimponens,** Lesq.; Lesq. & James, Mosses of N. America, 393; Canadian Musci, No. 349.

Old logs, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Green Harbor, Newfoundland. (*Rev. A. Waghorne.*) Very common on trees and on the ground in British Columbia and on Vancouver Island. (*Lyall.*) On wet rocks at Revelstoke, Deer Park (Lower Arrow Lake), and at Pass Creek Falls, near Sproat, Columbia River; abundant on rocks at Victoria, Vancouver Island. (*Macoun.*) On logs at Comox, Vancouver Island. (*Dawson.*)

Var. **cristula,** Kindb. Bull. Torr. Bot. Club, XVII., 280; Canadian Musci, No. 350.

Leaves green or brownish-green, estriate, filiform-pointed, the point a little shorter than the lanceolate base. Capsule, cylindric, narrow, faintly curved, suberect; teeth at the base pale yellow, hyaline above; perichetial leaves faintly striate.

Quite common on rocks in oak woods, near Victoria, Vancouver Island; fruiting abundantly in April, 1887; on rocks at Moodyville, Burrard Inlet, B.C. (*Macoun.*)

(882.) **H. revolutum,** (Mitt.) Lindb.

H. Heufleri, Jur.; Schimp. Syn. ed. II, 760.

On dry rocks at Morley, foothills of Rocky Mountains; also on dry rocks, three miles below Hector, Rocky Mountains. (*Macoun.*) Greenland. (*Fl. Gr.*)

(883.) **H. plicatile,** (Mitt.) Lesq. & James, Mosses of N. America, 394; Canadian Musci, No. 352.

Davis Strait. (*Taylor.*) Rocky Mountains. (*Bourgeau.*) On stones, Cypress Hills, Alberta; on rocks at the Rocky Mountain Cañon, Peace River, lat. 56°; on rocks near Lesser Slave Lake, N.W.T.; on dry rocks at Lytton, B.C.; very abundant on rocks on the summit of Tunnel Mountain and other mountains at Banff, Rocky Mountain Park. (*Macoun.*) This species is probably not distinct from *H. revolutum.*

(884.) **H. cupressiforme,** Linn.; Lesq. & James, Mosses of N. America, 394; Canadian Musci, No. 351.

Miquelon Island. (*Delàmare.*) Pictou Co., N.S. (*McKay.*) River Montmorency, Beauport, Que. (*St. Cyr.*) New Harbor, St. Johns Green Willow, and Bay Robert, Newfoundland. (*Rev. A. Waghorne.*) On earth at Truro and on logs at Pirate's Cove, Straits of Canso, N.S.; on rocks, South-west Point, Anticosti; on logs, Ste. Anne des Monts River, Gaspé Co., Que.; on earth and rocks, shore of Lake Winnipegoosis, Man.; on earth, Cypress Hills, Alberta; base of Saddle Mountain, Devil's Lake, Rocky Mountains; on rocks at Yale, B.C.; on earth, Comox, Vancouver Island. (*Macoun.*)

(885.) **H. complexum,** Lesq. & James, Mosses of N. America, 396.

On rocks, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On rocks between Fort William and Cumberland House. (*Richardson.*)

(886.) **H. arcuatiforme,** Kindb. (n. sp.)

Tufts dense, green, not glossy. Stem creeping, subpinnate. Leaves arcuate, ovate-lanceolate, generally short-acuminate or sub-obtusate, entire, decurrent, not striate; alar cells large, well-defined, orange, the other pale and narrow; costa none or short and double. Capsule subcylindric, curved, not striate nor furrowed, constricted below the wide mouth; teeth when dry incurved, pale-yellow, hyaline-margined; cilia long, appendiculate; pedicel about 3 cm. long. Probably dicœcious. Resembles in habit *Hypnum cupressiforme.* Lid and male flowers not found.

The allied *Hypnum Lindbergii,* Mitt., (*H. arcuatum,* Lindb.) differs at once in the not creeping, irregularly divided stem, the shorter pedicel, the larger capsule, &c.

On earth near the gate of the cemetery at Beechwood, near Ottawa, Ont., September 29th, 1889. (*Macoun.*)

(887.) **H. Lindbergii,** Mitt.

H. arcuatum, Lindb.

On rocks at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Greenland. (*Fl. Gr.*) Miquelon Island. (*Delàmare.*) Topsail Harbor, Newfoundland. (*Rev. A. Waghorne.*)

(888.) **H. Renauldii,** Kindb. (n. sp.)

Agrees with *H. curvifolium* in the stem being more or less pinnate, the inner basal leaf cells finally yellow; with *H. Lindbergii* in the leaves being decurrent, alar cells very much dilated, the capsule not plicate in a dry state; differs from both in the entire leaves. *Hyynum pratense* differs in the leaves not being striate nor decurrent, and alar cells not evolute.

On earth at Sicamous, B.C.; on wet ground and old logs at Revelstoke, B.C.; on rocks, Sydenham River, Owen Sound, Ont.; on earth, near the small lake north of the Aylmer Road, Hull, Que.; on earth at Hunter's River, Prince Edward Island. (*Macoun.*) On earth, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) New Harbor and St. Johns, Newfoundland. (*Rev. A. Waghorne.*)

(889.) **H. curvifolium,** Hedw.; Lesq. & James, Mosses of N. America, 396; Canadian Musci, No. 353; Drumm. Musc. Bor.-Am., No. 197.

Miquelon Island. (*Delàmare.*) Topsail Harbor, Newfoundland. (*Rev. A. Waghorne.*) Bass River, N.B. (*Fowler's Cat.*) On logs,

Tobique River, N.B. (*Hay.*) Decayed logs, River Rouge, Argenteuil Co., Que. (*D'Urban.*) On earth at Truro, N.S.; on old logs at Ottawa; abundant on logs by swamps at Belleville, Wooler, Port Dover and Leamington, Ont.; on rocks at Nepigon River, Ont. (*Macoun.*) Prospect Creek, B.C. (*Dawson.*) Vicinity of London, Ont. (*J. Dearness.*) Moist shady places in Upper Canada (Ontario.) (*Drummond.*)

(890.) **H pratense,** Koch, MS.; Lesq. & James, Mosses of N. America, 397; Canadian Musci, No. 354.

H. amœnum, Drumm. Musc. Bor.-Am.. No. 196, in part.

Heart's Delight, Newfoundland. (*Rev. A. Waghorne.*) On earth Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Swamps near Carlton House. (*Drummond.*) On earth west of the Fraser River at Quesnel, B.C.; also at Comox, Vancouver Island. (*Macoun.*) Greenland. (*Fl. Gr.*)

(891.) **H. pseudo-pratense,** Kindb. (n. sp.)

Nearly allied to *Hypnum pratense.* Differs in the tufts being more compact, the branches radiculose below, the leaves more crowded, not decurrent, more distinctly denticulate near the apex, and in the monœcious inflorescence. Capsules not found.

On old logs in woods at the mouth of Sturgeon Creek, Leamington, Lake Erie, Ont., September 19th, 1890. (*Macoun.*)

(892.) **H. Bambergeri,** Schimp.; Lesq. & James, Mosses of N. America, 397.

Beechy Island and Wellington Channel. (*Lyall* fide *Mitten.*) Greenland. (*Fl. Gr.*)

Subgenus VIII. HETEROPHYLLUM, C. Mueller.

(893.) **H. Haldanianum,** Grev.; Lesq. & James, Mosses of N. America, 397; Canadian Musci, No. 355.

H. pulchrum, Drumm. Musc. Bor.-Am., No. 180, in part.

Pictou Co., N.S. (*McKay.*) On old logs; common, New Brunswick. (*Fowler's Cat.*) On decaying trunks, at Canaan Forks, N.B. (*J. Moser.*) On logs, Tobique River, N.B. (*Hay.*) On old logs, Truro, N.S.; abundant on rotten logs around Ottawa, Belleville and Wooler, Ont.; on logs at Lake Nipissing, Ont. (*Macoun.*) Common in cedar

swamps near London, Ont. (*J. Dearness.*) Upon trunks of trees in Upper Canada. (*Drummond.*)

(894.) **H. nemorosum,** Koch; Lesq. & James, Mosses of N. America, 398.

On decayed wood at Canaan Forks, Queen's Co., N.B. (*J. Moser.*)

(895.) **H. flaccum,** C. M. & Kindb. (n. sp.)

Tufts large and loose, brown below, pale-green above. Stems pinnate, sparingly radiculose, red-brown; branches elongate, attenuate, distant and flaccid; paraphyllia few, multiform. Leaves oblong-lanceolate, shortly subulate-acuminate, not curved, concave-involute, patent, with excavate dark-orange auricles at the base; stem-leaves decurrent, slightly recurved at the basal angles; branch-leaves loose, sub-distichous, not decurrent nor recurved; cells narrow, long-linear, not chlorophyllose, the alar large, subquadrate, the inner basal narrow, pale-orange; costa short, double and indistinct or none. Barren.

On old logs (or rocks) Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On rocks at the foot of Jones Falls, Sydenham River, Owen Sound, Ont. (*Macoun.*)

(896.) **H. subflaccum,** C. M. & Kindb. (n. sp.)

Cylindrothecium Drummondii, Canadian Musci, No. 436.

Tufts loose, glossy green. Stem green, irregularly branching, not radiculose; branches few and long, flaccid, sub-compressed when dry; paraphyllia none. Leaves striate, oblong-lanceolate, denticulate above to $\frac{1}{4}$, not curved, loosely appressed or subpatent; the basal angles hyaline, not excavate; stem-leaves short-decurrent, acute or short-acuminate; branch leaves not decurrent, longer acuminate; cells narrow, long-linear and chlorophyllose, the basal dilated, hyaline and irregular, sub-rectangular, the inner rarely pale-yellowish; costa none. Dicœcious. Female plants not found. Habit of *Hypnum pratense*, but it has entire leaves.

On earth in the "Big Swamp," Murray, Northumberland Co., Ont. October 9th, 1888. (*Macoun.*)

(897.) **H. pseudo-drepanium,** C. M. & Kindb. (n. sp.)

Tufts loose, green, faintly glossy. Secondary stems very long, flaccid, subpinnate, sparingly radiculose, faintly compressed; paraphyllia none; branchlets few and very short, curved at the apex. Leaves plicate, entire, from a short broad-ovate base narrowed into a

short incurved, acute acumen, crowded, loosely appressed when dry, not decurrent, not distinctly chlorophyllose; basal cells hyaline, dilated (the inner sometimes yellowish) thick-walled, the alar large sub-rectangular, well-defined, the other longer and narrower; auricles excavate; costa indistinct or short and double. Dicœcious. Female plants not found.

On old logs in woods, Dow's swamp, Ottawa, Ont., September 16th, 1889. (*Macoun.*)

Subgenus IX. LIMNOBIUM, Bruch & Schimp.

(898.) **H. palustre,** Huds.; Lesq. & James, Mosses of N. America, 398; Canadian Musci, No. 356; Drumm. Musc. Bor.-Am., No. 195.

Upon rocks in rivers; common. (*Drummond.*) On rocks in brooks, Never's Rapids, Queen's Co., N.B. (*J. Moser.*) On stones in Jupiter River, Anticosti; on stones in Fox River and in Ste. Anne des Monts River, Gaspé Co., Que.; on rocks below Jones Falls, near Owen Sound, Ont.; on stones Black River, Lake Nepigon; also on rocks in Current River, near Port Arthur, Lake Superior; on stones in Swift Current Creek, Assiniboia; in a ravine on Sulphur Mountain, at Banff, Rocky Mountains; on stones in a brook, Roger's Pass, Selkirk Mountains; in a brook at Deer Park, Columbia River; in a creek at Spence's Bridge, B.C. (*Macoun.*) On wet rocks summit of Mount Queest, Gold Range and up the North Thompson River, B.C. (*J. M. Macoun.*)

(899.) **H. Columbico-palustre,** C. M. & Kindb. (n. sp.); Canadian Musci, No. 493.

Differs from *Hypnum palustre* in the leaves being longer-apiculate, faintly denticulate, the margins recurved below at one side, the alar cells dilated, well-defined, the costa stout, vanishing above the middle.

On rocks at the mouth of the Illicillewaet Cañon, near Revelstoke, B.C., May 18th, 1890. (*Macoun.*)

(900.) **H. dilatatum,** Wils.; Canadian Musci, No. 357.

H. (*Limnobium*) *molle,* Lesq. & James, Mosses of N. America, 399; Drumm. Musc. Bor.-Am., No. 194.

On stones in Gull River, Victoria Co., Ont.; on stones in brooks along the north shore of Lake Superior; abundant on stones in the Kamanistiquia River, below Kakabeka Falls, west of Lake Superior; on rocks in the stream that discharges the Asulcan Glacier, Selkirk

Mountains, B.C. (*Macoun.*) In rivulets, immediately to the westward of the "Height of Land," Rocky Mountains. (*Drummond.*) Greenland. (*Fl. Gr.*)

(901.) **H. pseudo-arcticum,** Kindb., Bull. Torr. Bot. Club, XVII, 280.

Differs from *H. arcticum* in the leaves being crenulate at least above the middle; costa short and double, not reaching to the middle; perichetial leaves short-acuminate, serrulate. Peristomial segments rimose in the middle. Stem sparingly radiculose.

On stones in mountain brooks near Sicamous; and in brooks on the Gold Range, north of Griffin Lake, B.C.. July 9th, 1889. (*Macoun.*)

(902.) **H. Norvegicum,** Bruch & Schimp., Bryol. Europ. VI.

Greenland. (*Fl. Gr.*)

(903.) **H. polare,** Lindb.

Greenland. (*Fl. Gr.*)

(904.) **H. circulifolium,** C. M. & Kindb. (n. sp.)

Nearly allied to *Hypnum dilatatum*, Wils. (*H. molle*, Lesq. & James). Stem loosely foliate, denudate at the base. Leaves patent, when dry subcircular, faintly crenulate nearly all around, slightly decurrent, at the cordate base distinctly auriculate and in the middle carinate, narrowed above to an indistinct obtuse tip; alar cells large, inflate, suboval, the apical also short, the other narrow and flexuous; costa none or indistinct. Barren.

On rocks, Never's Rapids, Queen's Co., N.B., July, 1889. (*J. Moser.*)

(905.) **H. arcticum,** Sommerf.; Lesq. & James, Mosses of N. America, 400; Canadian Musci, No. 358.

On stones in Fox River and St. Anne des Monts River, Gaspé Co., Que.; on rocks along Lake Nepigon, Ont.; on stones in brooks, Roger's Pass, Selkirk Mountains, B.C.; also along the Quesnel River, Quesnel, B.C. (*Macoun.*) Rocky Mountains. (*Lyall.*) Greenland. (*Fl. Gr.*)

(906.) **H. Coulardi,** Schimp.

On stones in Ste. Anne des Monts River, Gaspé Co., Que.; and along Gunn River, Anticosti. (*Macoun.*)

(907.) **H. torrentis,** C. M. & Kindb. (n. sp.)

H. Goulardi, Canadian Musci, No. 503.

Differs from *H. Goulardi* in the stems being filiform, very rigid, the leaves smaller, subcircular, crenulate all around, reflexed at the basal margins, the costa thick and nearly percurrent; it differs also from *Hypnum arcticum* in the loosely disposed, decurrent leaves and their large angular cells.

On sloping limestone rocks in the bed of the torrent a little above the station at Hector, Rocky Mountains, August 12th, 1890. (*Macoun.*)

(908.) **H. alpestre,** Swartz.; Lesq. & James, Mosses of N. America, 399; Canadian Musci, No. 396.

On rocks in a glacier stream discharging the melted snow on the east side of Castle Mountain, and on Vermillion Mountain at Banff, Rocky Mountains. (*Macoun.*) Greenland. (*Fl. Gr.*)

(909.) **H. montanum,** Wils. MS.; Lesq. & James, Mosses of N. America, 401.

On damp rocks in the bed of Sydenham River at Owen Sound, Ont. (*Macoun.*) Pickle Harbor, Newfoundland. (*Rev. A. Waghorne.*)

(910.) **H. pseudo-montanum,** Kindb. (n. sp.); Canadian Musci, No. 539.

Nearly allied to *Hypnum montanum,* differing principally in the stem being longer and more robust, the leaves larger and thinner, more loosely disposed, longer decurrent, not distinctly denticulate, the alar cells large, reaching to the costa, which is simple and prolonged above the middle. Inflorescence monœcious. Capsules not found.

This species and *Hypnum montanum* have a peculiar habit in the leaves being variously curved, either incurved or recurved in the same specimen, and are rather appearing to belong to the section *Campylium.* Their position in the section *Limnobium* is at least doubtful.

On rocks in all the streams around Owen Sound, especially below Jones Falls and the Potawatomie Falls, September 15th, 1890. (*Macoun.*)

(911.) **H. eugyrium,** Schimp.; Lesq. & James, Mosses of N. America, 401; Canadian Musci, No. 535.

On stones, Bass River, N.B. (*Fowler's Cat.*) On stones in the brook at Pirate's Cove, Straits of Canso, N.S.; on stones in a ravine, Sulphur Mountain, Banff, Rocky Mountains. (*Macoun.*) Pictou Co.,

N.S. (*McKay.*) Miquelon Island. (*Delàmare.*) Chance Cove, Green Island, White Bay and Topsail Harbor, Newfoundland. (*Rev. A. Waghorne.*)

(912.) **H. ochraceum,** Turner, MS. ; Lesq. & James, Mosses of N. America, 401 ; Canadian Musci, No. 360.

Pictou Co., N.S. (*McKay.*) Battle Harbor, Labrador; and Broad Cove, Newfoundland. (*Rev. A. Waghorne.*) Kent Co., and Fredericton, N.B. (*Fowler's Cat.*) On stones in brooks, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On stones in brooks at Truro, N.S. ; on wet rocks at Mamainse, Michipicotin and Otter Head, Lake Superior ; on rocks in brooks, House Mountain, near Lesser Slave Lake, N.W.T. ; on wet rocks, Peace River, at Hudson Hope, lat. 56° ; on earth and stones, Bear Creek, Roger's Pass, Selkirk Mountains, B.C. ; on stones in streams on the Gold Range, north of Griffin Lake, B.C. ; also on dripping rocks, North Arm, Burrard Inlet, B.C. (*Macoun.*) Cascade Mountains, B.C. (*Lyall.*) Davis Straits. (*Taylor.*) Greenland. (*Fl. Gr.*) Sitka, Alaska, 1891. (*J. M. Macoun.*)

(913.) **H. stramineum,** Dicks.

H. (*Calliergon*) *stramineum,* Dicks ; Lesq. & James, Mosses of N. America, 405 ; Canadian Musci, No. 473 ; Drumm. Musc. Bor.-Am., No. 210.

In a marsh at the " Height of Land," Rocky Mountains ; but rare. (*Drummond.*) Miquelon Island. (*Delàmare.*) Hopewell Bay, Newfoundland ; Indian Harbor, and Venison Tickle, Labrador. (*Rev. A. Waghorne.*) Cape Chudleigh, Mansfield Island and Nottingham Island, Hudson Strait. (*R. Bell.*) Bogs and swampy woods, Jupiter River, Anticosti. (*Macoun.*) Among sphagnum, at Bass River, N.B. (*Fowler's Cat.*) Peat bog, Mer Bleue, near Ottawa ; in a small bog two miles west of the C. P. Ry. station, Roger's Pass, Selkirk Mountains ; among grass at the summit of the Gold Range, north of Griffin Lake, B.C. (*Macoun.*) Greenland. (*Fl. Gr.*)

(914.) **H. trifarium,** Web. & Mohr.

H. (*Calliergon*) *trifarium,* Web. & Mohr ; Lesq. & James, Mosses of N. America, 405 ; Canadian Musci, No. 365.

In stagnant pools, Wellington Beach, Prince Edward Co., Ont. ; boggy shore of Lake Huron at the Fishing Islands, Bruce Co., Ont. ; in a bog at Hector, Rocky Mountains ; in peat bogs near the Nechacco River, Northern British Columbia. (*Macoun.*) Greenland. (*Fl. Gr.*)

(915.) **H. turgescens,** Schimp.

H. (*Calliergon*) *turgescens*, Schimp.; Lesq. & James, Mosses of N. America, 406; Canadian Musci, No. 483.

Davis Straits. (*Lyall.*) In boggy places at Hector, and in a glacier stream, on the mountain north of it, alt. 7,500 feet; also on Mount Aylmer, alt. 8,300 feet, Rocky Mountains; in a small brook, Roger's Pass, Selkirk Mountains, B.C. (*Macoun.*) Greenland. (*Fl. Gr.*)

(916.) **H. scorpioides,** Linn.

H. (*Scorpidium*) *scorpioides*, Linn.; Lesq. & James, Mosses of N. America, 406; Canadian Musci, No. 366; Drumm. Musc. Bor.-Am., No. 200.

Common in marshes near Carlton House. (*Drummond.*) In very marshy peat bogs, Salt Lake, Anticosti; on the boggy margins of small lakes near Marmora Village, North Hastings, Ont.; in bogs at Castle Mountain and Hector, Rocky Mountains. (*Macoun.*) Greenland. (*Fl. Gr.*) Miquelon Island. (*Delamare.*) Battle Harbor, Labrador; and Western Cove, White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(917.) **H. badium,** Hartm.

H. (*Calliergon*) *badium*, Hartm.; Lesq. & James, Mosses of N. America, 406.

On rocks, coast of Labrador. (*J. A. Allen.*) Greenland. (*Fl. Gr.*)

Subgenus X. CALLIERGON, Lesq. & James.

(918.) **H. cordifolium,** Hedw.; Lesq. & James, Mosses of N. America, 402; Canadian Musci, No. 361.

Pictou Co., N.S. (*McKay.*) Battle Harbor, Labrador; and New Harbor, Newfoundland. (*Rev. A. Waghorne.*) In wet sandy places, Bass River, N.B. (*Fowler's Cat.*) Swamps, Tobique River, N.B. (*Hay.*) Damp woods, Tignish, Prince Edward Island; in wet woods at Beechwood and Dow's swamp, Ottawa; on the ground in swamps at Belleville and Wooler, Ont.; damp woods, Kakabeka Falls, west of Lake Superior; bogs at Morley, foothills of Rocky Mountains; in springs around Kicking Horse Lake, Rocky Mountains. (*Macoun.*) Greenland. (*Fl. Gr.*) Near London, Ont. (*J. Dearness.*)

(919.) **H. giganteum,** Schimp. ; Lesq. & James, Mosses of N. America, 403 ; Canadian Musci, No. 362.

H. cordifolium, Drumm. Musc. Bor.-Am., No. 209.

Common in swamps and marshy places. (*Drummond.*) In springs at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) In swamps at Becscie River, Anticosti ; peat bogs at Tignish, Prince Edward Island ; in swamps at Ottawa ; peat bogs, Oak Hills, Hastings Co., Ont. ; peat bogs, Porcupine Mountains, Man. ; in bogs on the slopes of House Mountain, near Lesser Slave Lake, N.W.T. ; in springs at Morley and Banff, Rocky Mountains ; in swamps at Craigellachie, Eagle River, B.C. ; also in springs at Revelstoke, B.C. (*Macoun.*) Greenland. (*Fl. Gr.*) Near London, Ont. (*J. Dearness.*)

(920.) **H. Richardsoni,** (Mitt.) ; Lesq. & James, Mosses of N. America, 404 ; Canadian Musci, No. 378.

H. trifarium, Drumm. Musc. Bor.-Am., No. 211.

Baffin's Bay, coast of Greenland. (*Inglefield.*) Swamps about the Great Bear Lake. (*Richardson.*) In a marshy bog at Tignish, Prince Edward Island ; in water along the south end of McKay's Lake at Ottawa, Ont. (*Macoun.*)

(921.) **H. sarmentosum,** Wahl. ; Lesq. & James, Mosses of N. America, 403 ; Canadian Musci, No. 363, in part.

In bogs at Bonne Esperance, Labrador. (*J. A. Allen.*) In bogs at Salt Lake, Anticosti. (*Macoun.*) Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Battle Harbor and Seal Islands, Labrador ; White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(922.) **H. cuspidatum,** Linn. ; Lesq. & James, Mosses of N. America, 403 ; Canadian Musci, No. 385.

Miquelon Island. (*Delàmare.*) Peaty meadow at Tignish, Prince Edward Island ; in swamps at Craigellachie, Eagle Pass, B.C. ; also in swampy woods near Comox, Vancouver Island. (*Macoun.*) Pack River, B.C. (*Lyall.*) Canaan Forks, Queen's Co., N.B. (*J. Moser.*) White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(923.) **H. purum,** Linn.

Miquelon Island. (*Delàmare.*)

(924.) **H. Schreberi,** Willd.; Lesq. & James, Mosses of N. America, 404; Canadian Musci, No. 364; Drumm. Musc. Bor.-Am., No. 208.

Shady woods; abundant. (*Drummond.*) In shady woods, Bass River, and Little Branch, Miramichi River, N.B. (*Fowler's Cat.*) Shaded ground, Queen's Co., N.B. (*J. Moser.*) On logs in woods, Tobique River, N.B. (*Hay.*) Pictou Co., N.S. (*McKay.*) Baie St. Paul, Charlevoix Co., Que. (*St. Cyr.*) Miquelon Island. (*Delàmare.*) Deep Water Creek and Battle Harbor, Labrador; Placentia Bay and Bay Robert, Conception Bay, Newfoundland. (*Rev. A. Waghorne.*) Quite common on logs and earth in shaded woods across the continent. Truro, N.S.; Brackley Point and Rustico Bay, Prince Edward Island; Gaspé Co., Que.; Ottawa, Belleville, Wooler and Owen Sound, Ont.; in woods, Lake Manitoba, Man.; on logs at Revelstoke, Columbia River, B.C.; also at Moodyville, Burrard Inlet, B.C.; common in woods at Quesnel, B.C. (*Macoun.*) Saskatchewan. (*Bourgeau.*) Greenland. (*Fl. Gr.*) Sitka. (*Roth. Alask.*) Kadiak Island, Alaska. (*J. M. Macoun.*)

129. HYLOCOMIUM, Schimp.

(925.) **H. splendens,** (Hedw.) Schimp.

Hypnum (*Pleurozium*) *splendens,* Hedw.; Lesq. & James, Mosses of N. America, 407; Canadian Musci, No. 367; Drumm. Musc. Bor.-Am. No. 218.

Shady woods. (*Drummond.*) Pictou Co., N.S. (*McKay.*) Miquelon Island. (*Delàmare.*) Battle Harbor, Labrador; and New Harbor, Newfoundland. (*Rev. A. Waghorne.*) On old logs; common, N.B. (*Fowler's Cat.*) On earth in woods, Never's Rapids, Queen's Co., N.B (*J. Moser.*) On earth at Tobique River and Lac Bean, N.B. (*Hay.*) Fallen trees, River Rouge, Argenteuil Co., Que. (*D'Urban.*) Very common near London, Ont. (*J. Dearness.*) Quite common on logs and earth in cool shady woods across the continent. Common at Brackley Point, Prince Edward Island; South-west Point, Anticosti; Pirate's Cove, Straits of Canso, N.S.; Gaspé Co., Que.; at Ottawa, Carleton Place, Belleville, and Owen Sound, Ont.; common in the Rocky Mountains at Hector, Lake Louise and Banff; in woods along the Columbia River at Revelstoke, B.C.; at Quesnel on the Fraser River, and Hastings Burrard Inlet, B.C.; common in woods, Vancouver Island. (*Macoun.*) Alert Bay, Vancouver Island, and Queen Charlotte Islands. (*Dawson.*) In woods along the Athabasca River, N.W.T., and Sitka, Alaska. (*J. M. Macoun.*) Nulato and Alaska. (*Roth.*

Alask.) St. Paul Island, Behring Sea. (*Palmer.*) Greenland. (*Fl. Gr.*)

Var. **compactum,** Lesq. & James.

Near Forteau, Labrador. (*J. A. Allen.*)

(926.) **H. Alaskanum,** (Lesq. & James). Kindb.

Hypnum (*Calliergon*) *Alaskanum*, Lesq. & James, Mosses of N. America, 405. *H. umbratum*, Canadian Musci, No. 368, in part.

On earth in woods at Morley, Rocky Mountains; also on earth in mountain woods at Spence's Bridge, B.C., alt. 3,500 feet; in woods at House Mountain, near Lesser Slave Lake, N.W.T. (*Macoun.*) On the ground in Alaska. (*Lesq. & James.*) St. Paul Island and Ounalaska, Behring Sea, 1891. (*J. M. Macoun.*)

(927.) **H. umbratum,** (Ehrh.) Schimp.

Hypnum (*Pleurozium*) *umbratum*, Ehrh.; Lesq. & James, Mosses of N. America, 407; Canadian Musci, No. 368, in part.

Large patches in shady woods, Bass River, N.B. (*Fowler's Cat.*) In woods at Chipman, Queen's Co., N.B. (*J. Moser.*) On rocks at Pirate's Cove, Straits of Canso, and at Truro, N.S.; on earth in woods, Hunter's River, Prince Edward Island; on rocks, Mount Albert, Gaspé Co., Que. (*Macoun.*) Pictou Co., N.S. (*McKay.*) Miquelon Island. (*Delamare.*) Bay Bull Arm, Placentia Bay, and Western Cove, White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(928.) **H. pyrenaicum** (Spruce.) Lindb.

Hypnum (*Pleurozium*) *Oakesii*, Sulliv.; Lesq. & James, Mosses of N. America, 408; Canadian Musci, No. 369.

On stones at Canaan Forks, Queen's Co., and Tay, York Co., N.B. (*J. Moser.*) On old logs at Owen Sound, Ont.; on logs at Revelstoke, Columbia River, B.C. (*Macoun.*)

(929.) **H. brevirostre,** (Ehrh.) Schimp.

Hypnum (*Pleurozium*) *brevirostre*, Ehrh.; Lesq. & James, Mosses of N. America, 408; Canadian Musci, No. 373.

On rocks, Pirate's Cove, Straits of Canso, N.S.; on rocks near the "High Falls," Lievre River, Que.; deep shaded ravines at Owen Sound, Ont. (*Macoun.*) On rocks, Halifax Co., N.S. (*J. Moser.*) Pictou Co., N.S. (*McKay.*) Miquelon Island. (*Delamare.*)

(930.) **H. squarrosum,** (Linn.) Schimp.

Hypnum (*Hylocomium*) *squarrosum,* Linn. ; Lesq. & James, Mosses of N. America, 409 ; Canadian Musci, No. 370.

Pictou Co., N.S. (*McKay.*) Placentia Bay, Newfoundland. (*Rev. A. Waghorne.*) In woods along Jupiter River and Gunn River, Anticosti ; on earth along Bear Creek, and Glacier Creek, Roger's Pass, also at Albert Cañon, Selkirk Mountains, B.C. ; wet places along Lake Mara, Sicamous, and on the mountains north of Griffin Lake, B.C. ; in a small creek, New Westminster Junction and along Burrard Inlet at Moodyville, B.C. (*Macoun.*) Sitka. (*Roth. Alask.*) St. Paul Island and Attu Island, Behring Sea, 1891. (*J. M. Macoun.*) St. Paul Island, Behring Sea. (*Palmer.*) Greenland. (*Fl. Gr.*)

* **H. clavescens,** (Wils.) Lindb. ; Canadian Musci, No. 450.

On rocks (fruiting) at Truro, N.S. ; on rocks, North Arm, Burrard Inlet, B.C. (*Macoun.*)

(931.) **H. triquetrum,** (Linn.) Schimp.

Hypnum (*Hylocomium*) *triquetrum,* Linn. ; Lesq. & James, Mosses of N. America, 409 ; Canadian Musci, No. 371 ; Drumm. Musc. Bor.-Am., No. 182.

Shady woods ; not uncommon. (*Drummond.*) On the ground in woods, Bass River, N.B. (*Fowler's Cat.*) On the ground in woods, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On logs, Tobique River, N.B. (*Hay.*) Pictou Co., N.S. (*McKay.*) Miquelon Island. (*Delamare.*) On old logs in woods, River Rouge, Argenteuil Co., Que. (*D'Urban.*) On earth in woods, Brackley Point, Prince Edward Island ; on earth in woods, Pirate's Cove, Straits of Canso, N.S. ; in woods, Salt Lake, Anticosti ; common in woods, Gaspé Co., Que. ; common in woods at Ottawa, Belleville and Owen Sound, Ont. ; in woods, Red Rock, Lake Superior ; in woods at Banff, Rocky Mountains ; on earth in woods at Revelstoke, B.C. ; on earth at Hastings, Burrard Inlet, B.C. ; abundant in woods at Victoria and Cedar Hill, Vancouver Island. (*Macoun.*) Very common at London, Ont. (*J. Dearness.*) Nulato and Alaska. (*Roth. Alask.*) Sumas Prairie, lat. 49, B.C. (*Lyall.*) Cape Vancouver, Alaska, 1891. (*J. M. Macoun.*) St. Paul Island, Behring Sea. (*Palmer.*)

(932.) **H. robustum,** (Hook.) Kindb, enumer. bryin, exotic.

Hypnum (*Rhytidium*) *robustum*, Hook.; Lesq. & James, Mosses of N. America, 388; Canadian Musci, No. 342; Drumm. Musc. Bor.-Am., No. 199.

H. (*Hylocomium*) *Flemmingii*, Lesq. & James, Mosses of N. America. 410.

Upon the ground, on the large hill to the westward of the "Height of Land," Rocky Mountains. (*Drummond.*) On earth in woods along the Columbia River at Revelstoke, also in woods at the Hot Springs, Kootanie Lake, B.C.; in woods at Roger's Pass, Selkirk Mountains, B.C.; very abundant on the slopes of Mount Benson, Nanaimo and at Victoria, Vancouver Island. (*Macoun.*) North-west coast. (*Menzies.*)

(933.) **H. loreum,** (Linn.) Schimp.

Hypnum (*Hylocomium*) *loreum*, Linn.; Lesq. & James, Mosses of N. America, 410; Canadian Musci, No. 372.

Aspey Bay, Cape Breton. (*McKay.*) Miquelon Island. (*Delâmare.*) Grand Vâche, Newfoundland. (*Rev. A. Waghorne.*) On logs, Pirate's Cove, Straits of Canso, N.S.; on old logs at Revelstoke, and on earth at Hastings, B.C.; on logs at Victoria, and Comox, Vancouver Island. (*Macoun*) On logs, Queen Charlotte Islands, and in Johnston Straits, Gulf of Georgia, B.C. (*Dawson.*) Sitka and Alaska. (*Roth. Alask.*) Kadiak Island and Sitka, Alaska, 1891. (*J. M. Macoun.*) Woods, Sumas, lat. 49°, B.C. (*Lyall.*)

Additions and Corrections.

SPHAGNUM, Dill.

(1.) **S. fimbriatum,** Wils.

Little Bay Islands, Labrador. (*Rev. A. Waghorne.*) Bogs, Ounalaska Island, Behring Sea, 1891. (*J. M. Macoun.*)

Var. **arcticum,** C. Jensen.

Hopewell Bay and Grand Vâche, Newfoundland; Trap Cove, Labrador. (*Rev. A. Waghorne.*) St. Matthew Island, Behring Sea, and Cape Vancouver, Alaska, 1891. (*J. M. Macoun.*)

Var. **robustum,** Warnst.

In a swamp at Burnaby Lake, near Hastings, B.C., 1891. (*Law.*)

(2.) **S. Girgenshonii,** Russ.

Black River, Placentia Bay, New Harbor, Green Harbor, and White Bay, Newfoundland. (*Rev. A. Waghorne.*) St. George Island, Behring Sea; Kadiak Island, Alaska, 1891. (*J. M. Macoun.*)

(3.) **S. Russowii,** Warnst.

Spreadeagle, Norman's Cove, Western Cove, Harbor Deep, Lonely Island, North-West River and East Harbor, Newfoundland; Squaw Island, Labrador. (*Rev. A. Waghorne.*)

Var. **Girgensohnioides,** Russ.

Green Harbor, Newfoundland. (*Rev. A. Waghorne.*) In a swamp at Hot Springs, Kootanie Lake, B.C. (*Macoun.*)

(4) **S. fuscum,** Von Klinggraeff.

Western Cove, Harbor Deep, and New Harbor, Newfoundland; Mount Vesuvius, Labrador. (*Rev. A. Waghorne.*) Sundance Creek, Banff, Rocky Mountains. (*Macoun.*)

Var. **pallescens,** Warnst.

Western Cove, and White Bay, Newfoundland. (*Rev. A. Waghorne.*) Kadiak Island, Alaska, 1891. (*J. M. Macoun.*)

(5.) **S. tenellum** var. **rubellum,** Warnst.

Black River, Placentia Bay; Western Cove and Seal Cove, White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(6.) **S. Warnstorfii,** Russ.

Near Seal Cove, White Bay, Newfoundland. (*Rev. A. Waghorne.*)

Var. **viride,** Warnst.

Bogs, Sundance Creek and near the Railway Station at Banff, Rocky Mountains, July 25th, 1891. (*Macoun.*)

Var. **purpurascens,** Russ.

In a bog at Sundance Creek, Rocky Mountains, July 25th, 1891. (*Macoun.*)

(7.) **S. quinquefarium,** (Braithw.) Warnst.

New Harbor, Newfoundland. (*Rev. A. Waghorne.*) In a peat bog along the railway below Casselman, Russell Co., Ont. (*Macoun.*)

(8.) **S. acutifolium,** Russ. & Warnst.

Norman Cove, Green Harbor, Spreadeagle, Hopewell Bay and White Bay, Newfoundland; Cartridge Bight, Seal Islands and Spence's Cove, Labrador. (*Rev. A. Waghorne.*)

Var. **versicolor,** Warnst.

Peat bog, Sundance Creek, Banff, Rocky Mountains. (*Macoun.*) Fort Simpson, B.C., 1891. (*J. M. Macoun.*)

Var. **pallescens,** Warnst.

New Harbor, Newfoundland; Swan River, Labrador. (*Rev. A. Waghorne.*)

Var. **rubrum,** Warnst.

Placentia Bay, West Bay River, Spreadeagle, Harbor Deep, Green Harbor, and near Seal Cove, White Bay, Newfoundland; Trap Cove, Caribou Island and Indian Harbor, Labrador. (*Rev. A. Waghorne.*)

Attu Island, Behring Sea ; Kadiak Island, Alaska, and Fort Simpson, B.C., 1891. (*J. M. Macoun.*)

(934.) **S. Labradorense,** Warnstorf. (n. sp.)

This species belongs to the *Acutifoliæ* group, and is characterized by yellow woody corpuscules of the stem, by stem-leaves tongue or spatula-shaped, without fibres, narrowly edged, their hyaline cells generally 1—4 parted and showing on their inward surface great gaps in the membrane. The leaves of the branches are eggshaped, toothed at their broadly truncated apex, almost or not at all edged, and finely denticulated on their upper edge. Pores are found on the inward side in small numbers ; these are small toward the apex and are situated in the corners of the cells ; there are besides a few large holes toward the middle near the lateral edges. On the outside the pores are very numerous, narrowly elliptic, and are near the commisures ; downward and toward the lateral edges they become broader and larger. The chlorophyll cells appear in transverse section equilaterally triangular and have a thin wall around ; on the exterior they are well enclosed by the hyaline cells which are much arched forward. Plants above dark dirty purple.

Black River, Placentia Bay, Newfoundland, May 7th, 1891. (*Rev. A. Waghorne.*)

(9.) **S. subnitens,** Russ. & Warnst.

Eagle Harbor and Green Harbor, Newfoundland, April 12th, 1891. (*Rev. A. Waghorne.*)

Var. **flavicomans,** Card.

New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

(10.) **S. Lindbergii,** Schpr.

Near Seal Cove White Bay, Newfoundland ; Mount Vesuvius, Fox Harbor, and Indian Harbor, Labrador. (*Rev. A. Waghorne.*)

(11.) **S. riparium,** Aongstr.

St. George Island, Behring Sea, 1891. (*J. M. Macoun.*)

(12.) **S. recurvum,** Russ. & Warnst.

Broad Cove, New Harbor and Hopewell Bay, Newfoundland ; Indian Harbor, Labrador. (*Rev. A. Waghorne.*) Kadiak Island, Alaska, 1891. (*J. M. Macoun.*)

Var. **pulchrum,** Lindb.

Placentia Bay, Newfoundland ; Trap Cove, Caribou Island and St. Michael's, Labrador. (*Rev. A. Waghorne.*)

Var. **mucronatum,** Russ.

Placentia Bay, near Seal Cove, Green Harbor and White Bay, Newfoundland ; Indian Harbor, Labrador. (*Rev. A. Waghorne.*)

Var. **parvifolium,** Warnst.

Placentia Bay and Hopewell Bay, Newfoundland. (*Rev. A. Waghorne.*)

(13.) **S. cuspidatum,** Russ. & Warnst. var. **Torreyanum,** Sulliv.

Placentia Bay, Newfoundland. (*Rev. A. Waghorne.*)

Var. **plumosum,** Bryol. Germ.

Race Course, Ottawa. (*Fletcher.*)

(15.) **S. squarrosum,** Pers.

Bay Bull Arm, White Bay, Broad Cove and New Harbor, Newfoundland; Indian Harbor, Labrador. (*Rev. A. Waghorne.*) Petropaulowski (Asia), 1891. (*J. M. Macoun.*) Damp woods near Ottawa. (*Macoun.*)

Var. **semisquarrosum,** Russ.

Cape Vancouver, Alaska, 1891. (*J. M. Macoun.*)

Var. **imbricatum,** Schp.

Atkah Island and St. George Island, Behring Sea ; Cape Vancouver, Alaska, 1891. (*J. M. Macoun.*)

(16.) **S. teres,** Aongstr.

Harbor Deep, Newfoundland ; Battle Harbor and St. Michael's Bay, Labrador. (*Rev. A. Waghorne.*) Attu Island, Behring Sea, 1891. (*J. M. Macoun.*)

(18.) **S. compactum,** DC.

Broad Cove, Newfoundland. (*Rev. A. Waghorne.*)

Var. **squarrosum,** Russ.

Damp ground, Canaan Forks, Queen's Co., N.B. (*J. Moser.*)

Var. **imbricatum,** Warnst.

Cartridge Bight and Indian Harbor, Labrador. (*Rev. A. Waghorne.*) Attu Island, Behring Sea, 1891. (*J. M. Macoun.*)

(19.) **S. Carberi,** Lesq. & James.

Between Black River and North Harbor, Placentia Bay, Newfoundland. (*Rev. A. Waghorne.*)

(20.) **S. Pylaiei,** Brid. var. **ramosum,** Warnst.

Near Black River, Placentia Bay, Newfoundland; Venison Tickle, Seal Islands and Cartridge Bight, Labrador. (*Rev. A. Waghorne.*)

(21.) **S. subsecundum,** Nees.

Witless Bay Road, New Harbor, Newfoundland. (*Rev. A. Waghorne.*) Hunter's Home, Queen's Co., N.B. (*J. Moser.*)

(22.) **S. rufescens,** Bryol. Germ.

Harbor Deep, Newfoundland. (*Rev. A. Waghorne.*)

(23.) **S. imbricatum,** Russ. var. **cristatum,** Warnst.

Placentia Bay and Green Island, Newfoundland. (*Rev. A. Waghorne.*) Attu Island, Behring Sea, 1891. (*J. M. Macoun.*)

(24.) **S. cymbifolium,** Ehrh.

Norman's Cove, Arnold's Cove, Harbor Deep and White Bay, Newfoundland; St. Michael's Bay, Labrador. (*Rev. A. Waghorne.*) Ounalaska Island, Behring Sea, 1891. (*J. M. Macoun.*)

(25.) **S. papillosum,** Lindb.

Black River, Placentia Bay and Green Harbor, Newfoundland; Battle Harbor and Indian Harbor, Labrador. (*Rev. A. Waghorne.*)

Var. **intermedium,** (Russ.) Warnst.

In damp woods at Casselman, near Ottawa, May 16th, 1891. (*Macoun.*)

(26.) **S. medium,** Limpr.

Topsail, Green Harbor, New Harbor, Harbor Deep, and White Bay, Newfoundland; Indian Harbor, Labrador. (*Rev. A. Waghorne.*) Fort Simpson, B.C., 1891. (*J. M. Macoun.*)

(27.) **S. molluscum,** Bruch.

Bay Bull Arm and Topsail, Newfoundland; Seal Islands, Labrador. (*Rev. A. Waghorne.*)

2. ANDREÆA. Ehrh.

(28.) **A. petrophila.** Ehrh.

Harbor Deep, Grand Vâche and White Bay, Newfoundland; Deep-water Creek, Venison Tickle, Battle Harbor and Bolster Rocks, Labrador. (*Rev. A. Waghorne.*)

8. GYMNOSTOMUM, Hedw.

(44.) **G. rupestre,** Schwaegr.

Battle Harbor, coast of Labrador; White Bay, Newfoundland. (*Rev. A. Waghorne.*) On limestone rocks, Owen Sound, Ont. (*Macoun.*)

(45.) **G. curvirostrum,** Hedw.

On wet rocks at the base of Saddle Mountain, Devil's Lake, Rocky Mountains. (*Macoun.*)

9. EUCLADIUM, Bryol. Europ.

(48.) **E. verticillatum,** Bryol. Europ.

White Bay, Newfoundland. (*Rev. A. Waghorne.*)

12. DICRANOWEISIA, Lindb.

(52.) **D. crispula,** Lindb.

On rocks, Venison Tickle and Indian Harbor. (*Rev. A. Waghorne.*) St. Paul Island, Behring Sea, 1891. (*J. M. Macoun.*) On rocks, Sulphur Mountain, Banff, Rocky Mountains. (*Macoun.*)

(935.) **D. obliqua,** Kindb. (?)

On rocks, St. Lawrence Island, Behring Sea, 1891. (*J. M. Macoun.*)

15. CYNODONTIUM, Schimp.

(57.) **C. Schisti,** Schimp.

Near New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

(61.) **C. subalpestre,** Kindb.

Dicranum polycarpum, Drumm. Musc. Bor.-Am., No. 103, in part.

Tufts green, about 1 cm. high or lower. Leaves crisped, from the narrowly ovate-oblong base attenuate-subulate, acute, nearly smooth also on the costa, entire or indistinctly denticulate above; borders recurved to the middle at one side; cells pellucid, mostly quadrate, the alar very much wider, rectangular, hyaline. Perichetial leaves with a broader base, the inner ones very much shorter. Capsule small, subcylindric-clavate, wide-mouthed, faintly striate when dry; teeth pale, bifid, not papillose; annulus wanting; lid conic, short-rostrate; pedicel yellow, finally bright-red.

On rocks below Norway House; abundant. (*Drummond.*)

(62.) **C. polycarpum,** Schimp.

The references belonging to *J. A. Allen's* specimens and those from Lake Nepigon belong here. White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(64.) **C. virens,** Schimp.

Grand Vâche and White Bay, Newfoundland; Battle Harbor, Indian Harbor, Seal Islands and Venison Tickle, Labrador. (*Rev. A. Waghorne.*) On earth near Fort Assiniboine, Athabasca River. (*Macoun.*)

Var. **serratum,** Bruch & Schimp.

On wet banks of a brook, flowing from Mount Macdonald, Roger's Pass, Selkirk Mountains. (*Macoun.*)

(65.) **C. Wahlenbergii,** (Brid.)

Battle Harbor, coast of Labrador. (*Rev. A. Waghorne.*) Cape Vancouver, Alaska, 1891. (*J. M. Macoun.*) St. Paul Island, Behring Sea. (*Palmer.*) "Dry Cañon," discharge of Devil's Lake, Rocky Mountain Park. (*Macoun.*)

Var. **compactum,** (Schimp.)

Indian Harbor, coast of Labrador. (*Rev. A. Waghorne.*)

16. DICHODONTIUM, Schimp.

(66.) **D. pellucidum,** Schimp.

Atkah Island and Ounalaska, Behring Sea, 1891. (*J. M. Macoun.*) White Bay, Newfoundland. (*Rev. A. Waghorne.*)

Var. **fagi-montanum,** Braithw.

Dicranum pellucidum, Drumm. Musc. Bor.-Am., No. 108.

Rocks of Portage River near the Columbia, Rocky Mountains. (*Drummond.*)

17. TREMATODON, Michx.

(68.) **T. ambiguum,** Hornsch.

Western Cove, White Bay, Newfoundland. (*Rev. A. Waghorne.*)

19. DICRANELLA. Schimp.

(72.) **D. Crevilleana,** Schimp.

On earth along the Columbia River at Revelstoke, B.C. (*Macoun.*)

(76.) **D. varia.** Schimp.

Quite common, Cave Avenue, Banff, Rocky Mountains. (*Macoun.*)

(78.) **D. rufescens,** Schimp.

On earth along the discharge of Leamy's Lake, near Ottawa. (*Macoun.*) Kadiak Island, Alaska; and Fort Simpson, B.C., 1891. (*J. M. Macoun.*)

(79.) **D. subulata,** Schimp.

St. Lawrence Island and St. Paul Island, Behring Sea; and Fort Simpson, B.C., 1891. (*J. M. Macoun.*)

(80.) **D. heteromalla,** Schimp.

Prince of Wales Island, Alaska; Skeena River, B.C., 1891. (*J. M. Macoun, Palmer.*) Harbor Deep, Newfoundland. (*Rev. A. Waghorne.*)

20. DICRANUM, Hedw.

(83.) **D. molle,** Wils.

St. Paul Island, Behring Sea, 1891. (*J. M. Macoun.*)

(84.) **D. Starkii,** Web. & Mohr.

Chance Cove, Newfoundland; Bolster Rocks, Labrador. (*Rev. A. Waghorne.*) Mountains east of Adam's Lake, B.C., alt. 5,600 feet. (*Dawson.*)

(86.) **D. strictum,** Schleich.

Athabasca River at its junction with the Clearwater River; Ounalaska and St. Paul islands, Behring Sea, 1891. (*J. M. Macoun.*)

(87.) **D. montanum.** Hedw.

Harbor Deep, Newfoundland. (*Rev. A. Waghorne.*) On the bases of trees at Hector, Rocky Mountains. (*Macoun.*)

(94.) **D. angustifolium,** Kindb.

D. angustifolium has a purplish-red beak on the capsule.

On earth in woods at Agassiz, B.C.; on Cedar Hill, Vancouver Island. (*Macoun.*) On earth, Alert Bay, Vancouver Island. (*Dawson.*) Ounalaska Island, Behring Sea, 1891. (*J. M. Macoun.*)

(95.) **D. sulcatum,** Kindb.

Leaves often falcate, about 5-8 mm. long; capsule sometimes distinctly strumose.

(99. **D. scoparium,** Hedw.

Western Cove, White Bay, Newfoundland. (*Rev. A. Waghorne.*) In woods along the Columbia River at Revelstoke, B.C. (*Macoun.*) Sitka and Kadiak islands, Alaska, 1891. (*J. M. Macoun.*)

Var. **scopariiforme,** Kindb.

On earth near Victoria, Vancouver Island, December 24th, 1872. (*Macoun.*) Seal Cove, White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(101.) **D. congestum,** Brid.

Harbor Deep and Bay Bull Arm, Placentia Bay, Newfoundland. (*Rev. A. Waghorne.*) Skeena River, B.C., 1891.) (*J. M. Macoun.*)

(102.) **D. fuscescens,** Turn.; Drumm. Musc. Bor.-Am., No. 82.

Upon roots of trees in Upper Canada (Ontario.) (*Drummond.*) Coachman's Cove, Newfoundland. (*Rev. A. Waghorne.*)

(103.) **D. Muehlenbeckii,** Bruch & Schimp.

On rocks, Battle Harbor, Labrador. (*Rev. A. Waghorne.*) On the bases of stumps, Fox River, Gaspé Co., Que.; on roots of trees, North Bay, Lake Nipissing, Ont. (*Macoun.*)

(104.) **D. brevifolium,** Lindb.; Canadian Musci., No. 588.

On rocks at the head of Lake Louise, Rocky Mountains; also along the Blackwater River, B.C. (*Macoun.*)

(936.) **D. spadiceum,** Zett. Musc. Pyrn., 1864, p. 70; Canadian Musci, No. 537.

D. neglectum, (Limpr.) Jur. & Milde.

On rocks, summit of Mount Niblock, Lake Agnes, alt. 8,000 feet; on rocks, Mount Aylmer near Devil's Lake, alt. 8,300 feet; and on rocks 3 miles below Hector, Rocky Mountains. (*Macoun.*)

(106.) **D. leucobasis,** C. M. & Kindb.

On earth in woods, Campbell Hill, Câche Creek, B.C., May 24th, 1875. (*Macoun.*)

(937.) **D. Sauteri,** Schimp. var. **pachytrichum,** Kindb. (n. var.)

Stem very tomentose in its whole length; pedicel short, about 1 cm. long. This species differs from *D. longifolium* in the very much narrower costa of the nearly entire leaves.

On sticks in a small brook coming in from the south in Roger's Pass, west of the C. P. Railway Station, Selkirk Mountains, July 29th, 1890. (*Macoun.*)

(107.) **D. elongatum,** Schwaegr.; Canadian Musci, No. 592.

Battle Harbor and Indian Harbor, Labrador. (*Rev. A. Waghorne.*) On earth in damp woods, east of Devil's Lake, Rocky Mountains. (*Macoun.*)

(109.) **D. fragilifolium,** Lindb.

D. elongatum var. *minor* Drumm. Musc. Bor.-Am., No. 92.

On decayed wood; rare. (*Drummond.*) On rocks, Lake Superior, above Michipicoten. (*Macoun.*)

(111.) **D. albicans,** Bruch & Schimp. var. **denticulatum,** Kindb. (n. var.) ; Canadian Musci, No. 589.

Costa minutely denticulate above.

On rocks, 3 miles below Hector, Rocky Mountains ; also on rocks in Roger's Pass, Selkirk Mountains, August 7th, 1890. (*Macoun.*)

(114.) **D. subpalustre,** C. M. & Kindb.

Along the Clearwater River, N.W.T. (*J. M. Macoun.*)

(115.) **D. Bergeri,** Bland.

Harbor Deep, Newfoundland. (*Rev. A. Waghorne.*) In a swamp, 15 miles west of Port Arthur, Lake Superior. (*Macoun.*)

(116.) **D. Drummondii,** C. Muell.

In woods, at Kicking Horse Lake, Rocky Mountains. (*Macoun.*)

Var. **trachyneuron,** Kindb.

In a swamp, 15 miles west of Port Arthur, Lake Superior. (*Macoun.*)

24. FISSIDENS, Hedw.

(131.) **F. osmundoides,** Hedw.

White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(132.) **F. adiantoides,** Hedw.

Battle Harbor, Newfoundland. (*Rev. A. Waghorne.*)

27. CERATODON, Brid.

(138.) **C. purpureus,** Brid.

Squaw Head and Venison Tickle, Labrador. (*Rev. A. Waghorne.*) St. Paul and Ounalaska islands, Behring Sea ; Sitka Island, Alaska ; and Skeena River, B.C., 1891. (*J. M. Macoun.*)

(938.) **C. heterophylla,** Kindb. Ott. Nat. Vol. V. 179.

Agrees with *Ceratodon purpureus* in the shape of the capsule, the stem-leaves and the not excurrent costa and the revoluble annulus, but the capsule is often more curved and distinctly strumose ; agrees with *Ceratodon conicus* (Hampe) in the peristomial teeth, having few articula-

tions ; differs from both in the blunt perichetial leaves, is also very peculiar in the short, concave suboval leaves of the long shoots.

On earth, St. Paul Island, Behring Sea, August 8th, 1891. (*J. M. Macoun.*)

29. DISTICHIUM, Bruch & Schimp.

(142.) **D. capillaceum,** Bruch & Schimp.

Lance la Loup, Little Bay islands and Battle Harbor, Labrador ; not uncommon. Western Cove, White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(143.) **D. inclinatum,** Bruch & Schimp.

Battle Harbor and Little Bay islands, Labrador ; also White Bay, Newfoundland. (*Rev. A. Waghorne.*)

34. POTTIA, Ehrh.

(157. **P. Heimii,** Fuern.

St. Matthew Island and Behring Island, Behring Sea, 1891. (*J. M. Macoun.*)

35. DIDYMODON, Hedw.

(160.) **D. rubellus,** Bruch & Schimp.

Rocky Mountain Cañon, Peace River, lat. 56°. (*Macoun.*) Clearwater River, near its confluence with the Athabasca, N.W.T. (*J. M. Macoun.*) White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(939.) **D. Baden-Powelli,** Kindb. Ott. Nat. Vol. V. 179.

Differs from *Didymodon rubellus* in the dicœcious inflorescense, the blunt, conic, very short lid, scarcely 1-5 of the capsule, and the distinctly dentate leaves (as in *Didymodon alpigenus*, Vent). The tufts are compact, about 2 cm. high, the leaves revolute nearly all around, short-acuminate the lower pale-brown ; the perichetial ones longer acuminate or subulate, entire ; the capsules are (unripe) more or less curved, the pedicel pale-red.

St. Paul Island, Behring Sea, August 3rd, 1891. (*J. M. Macoun.*)

37. LEPTOTRICHUM, Hampe.

(171.) **L. glaucescens,** Hampe.

Ounalaska Island, Behring Sea, 1891. (*J. M. Macoun.*)

38. TRICHOSTOMUM, Smith.

(940.) **T. (Timmiella) Vancouvericense,** (Broth.) Kindb.

Timiella Vancouvericensis, Broth. Bot. Centreblatt.

Differs from *Trichostomum flexisetum* (Bruch) Limpr. (*T. flexipes*, Bryol. Europ.) in its more robust stature, the shorter and slightly curved lid and the larger spores, about 0.012—0.014 mm.

On damp earth, Victoria, Vancouver Island. (*Dr. Rœll.*)

39. DESMATODON, Brid.

(173.) **D. latifolius,** Brid.

St. Paul Island, Behring Sea. (*Palmer.*)

41. BARBULA, Hedw.

(187.) **B. tortuosa,** Web. & Mohr.

White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(190.) **B. cæspitosa,** Schwaegr.

On earth by rocks at Revelstoke, B.C. (*Macoun.*)

(198.) **B. subgracilis,** C. M. & Kindb. var. **viridior,** Kindb. (n. var.)

Plants higher, about 1.5—2 cm. high, green and branching above, decolorate-brown below. Leaves when dry crispate, more papillose; costa green. Capsules not found.

On rocks along the Sydenham River, near Jones Falls, Owen Sound, Ont., September 17th, 1890. (*Macoun.*)

(941.) **B. vinealis,** Braun.; Lesq. & James, Mosses of N. America, 124.

On rocks, near the Whirlpool, Niagara Falls, Ont. (*Macoun.*) White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(200.) **B. fallax,** Hedw.

On rocks, wet with spray, Cañon of the Illicillewaet, at Revelstoke, B.C. (*Macoun.*) Drummond's No. 139 referred here belongs to the next species.

(942.) **B. pseudo-rigidula,** Kindb. (n. sp.)

B. rigidula, Canadian Musci, No. 412, in part.

Agrees with *Barbula rigidula* in the tufts being fuscescent, the leaves from a short erect base patent or recurved, contorted when dry, long-lanceolate, revolute below, nearly smooth, basal cells pellucid and rectangular, costa brown, nearly filling the narrow acumen ; differs in the leaf-borders not being thickened, the inner perichetial leaves from an oblong base, narrower acuminate with a long excurrent costa ; the peristome pale and distinctly contorted.

On earth by a brook at Lytton, B.C., April 17th, 1889. (*Macoun.*) (See No. 205.)

(205.) **B. spadicea,** Mitt.

On rocks along the Fraser River at Yale, B.C., December 9th, 1872. (*Macoun.*)

(207.) **B. brachyphylla,** Sulliv. var. **angustifolia,** C. M. & Kindb.

Tufts compact sparingly radiculose to the greater part, rusty-red, bright-green at the summit, 1-2 cm. high. Leaves shortly ovate-lanceolate, acute or subobtuse, indistinctly papillose, densely disposed, when dry appressed, borders reflexed nearly all around ; cells small, round-quadrate ; costa broad, reddish and percurrent. Barren.

(210.) **B. cylindrica,** Schimp.

Ounalaska Island, Behring Sea, 1891. (*J. M. Macoun.*)

(943.) **B. decursivula,** Kindb. (n. sp.)

Tufts rusty-red with green tops, about 2 cm. high. Stem radiculose below, not rigid ; branches long and filiform. Leaves small, when dry loosely appressed, open when moist, very broad at the base, subovate or ovate-oblong, acute or subobtuse, nearly smooth or faintly papillose at back, loosely disposed, long-decurrent ; borders reflexed nearly all around ; cells pellucid, subquadrate, only the alar elongate ; costa reddish, broad and percurrent. Barren.

This species, resembling *Barbula brachyphylla* in the short-leaves, &c., differs in the thinner branches and the leaves smaller, loosely disposed and long-decurrent.

On earth, on rocks at Hector, Rocky Mountains, August 15th, 1890. (*Macoun.*)

(214.) **B. convoluta,** Hedw. var. **obtusata,** Kindb. (n. var.)

Differs in the leaves being broader, generally obtuse, rarely subacute, and not apiculate.

On limestone rocks at the base of the cliff, Owen Sound, Ont., September 16th, 1890. (*Macoun.*)

(220.) **B. ruralis,** Hedw.

Shore of Lake Erie, at Port Colborne, Ont.; on dry rocks at Revelstoke, B.C. Peculiar forms of this species have been gathered on the east end of the Cypress Hills, Alberta; and on Mount Aylmer, north side of Devil's Lake, Rocky Mountains. (*Macoun.*)

(222.) **B. aciphylla,** Bruch & Schimp.

On rocks at Battle Harbor, Labrador. (*Rev. A. Waghorne.*) Abundant on Mount Aylmer, Devil's Lake, Rocky Mountains, alt. 8,300 feet. (*Macoun.*)

(223.) **B. megalocarpa,** Kindb.

On rocks " Dry Cañon, discharge of Devil's Lake, Rocky Mountains. (*Macoun.*)

(944.) **B. læviuscula,** Kindb. (n. sp.)

Tufts brown, radiculose at the base of the leaves, 3-4 cm. high. Leaves narrow, lingulate, carinate, nearly smooth or indistinctly papillose at the recurved borders; lower marginal cells of the leaf-base hyaline, short-rectangular in 1-2 rows, median yellow and porose in 2-3 rows, inner larger, longer and hyaline; costa red, indistinctly papillose at back, denticulate and hyaline near the long hispid hair-point. Capsule subcylindric, attenuate at the base to the pedicel; peristomial tubes very much shorter than the pale teeth.

Differs from *Barbula ruralis* principally in the nearly smooth leaves, the narrower capsule and the thinner pedicel.

On rocks on the summit of Tunnel Mountain, Banff, Rocky Mountains, July 6th, 1890. (*Macoun.*)

(945.) **B. (Syntrichia) ——** ?

This is in a barren state and hence doubtful. It differs from *B. ruralis* in the leaves being emarginate, less reflexed at the borders and the hair-point less hispid, &c.

On rocks at the base of Sulphur Mountain, Banff, Rocky Mountains, June 28th, 1891. (*Macoun.*)

(227.) **B. papillinervis,** C. M. & Kindb.

On Bolster Rocks, Labrador. (*Rev. A. Waghorne.*)

44. GRIMMIA, Ehrh.

(237.) **G. apocarpa,** Hedw.

White Bay and Trinity Bay, Newfoundland ; on rocks, Battle Harbor, Labrador. (*Rev. A. Waghorne.*) St. Paul Island, Behring Sea, 1891. (*J. M. Macoun.*)

(238.) **G. gracilis,** Nees & Hornsch.

Coachman's Cove, Newfoundland. (*Rev. A. Waghorne.*) On dry limestone rocks at Owen Sound, Ont. (*Macoun.*)

(239.) **G. rivularis,** Nees & Hornsch.

On rocks subject to inundation along the Columbia River, one mile above Revelstoke, B.C. (*Macoun.*)

(240.) **G. alpicola,** Swartz.

On rocks, Kadiak Island, Alaska, 1891. (*J. M. Macoun.*)

(243.) **G. maritima,** Turn.

Western Cove, White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(244.) **G. crassinervis,** C. Muell.

Ounalaska Island, Behring Sea, 1891. (*J. M. Macoun.*)

(258.) **G. torquata,** Grev.

Ounalaska Island, Behring Sea, 1891. (*J. M. Macoun.*)

(267.) **G. alpestris,** Schleich.

Avalanche Mountain, Selkirk Mountains, B.C. ; on rocks, Mount Aylmer, Rocky Mountains ; alt. 8,300 feet. (*Macoun.*)

(270.) **G. ovata,** Web. & Mohr.

Venison Tickle, Labrador. (*Rev. A. Waghorne.*)

(272.) **G. commutata,** Heuben.

On dry rocks, three miles below Hector, Rocky Mountains. (*Macoun.*)

(274.) **C. montana,** Bruch & Schimp.

On rocks, summit of Mount Niblock, at Lake Agnes, Rocky Mountains. (*Macoun.*)

45. RACOMITRIUM, Brid.

(278.) **R. patens,** Heuben.

Ounalaska and Attu islands, Behring Sea, 1891. (*J. M. Macoun.*)

(279.) **R. aciculare,** Brid.

On rocks, Battle Harbor, Labrador; Grand Vâche, Newfoundland. (*Rev. A. Waghorne.*) Prince of Wales Island, Alaska, 1891. (*J. M. Macoun.*)

(280. **R. Nevii,** C. Muell.

On Atkah Island, Behring Sea, 1891. (*J. M. Macoun.*)

(286.) **R. heterostichum,** Brid.

Cape Charles, Labrador. (*Rev. A. Waghorne.*)

(288.) **R. affine,** Lindb.

Harbor Deep, Newfoundland. (*Rev. A. Waghorne.*)

(289.) **R. fasciculare,** Brid.

Grand Vâche, White Bay and Harbor Deep, Newfoundland; Squaw Island, Battle Harbor, Seal Island and Venison Tickle, Labrador. (*Rev. A. Waghorne.*) Ounalaska Island, Behring Sea, and Cape Vancouver, Alaska, 1891. (*J. M. Macoun.*)

(293.) **R. microcarpum,** Brid.

Venison Tickle, Labrador; Green Pond and White Bay, Newfoundland. (*Rev. A. Waghorne.*)

Var. **Palmeri,** Kindb. (n. var.)

Differs in the leaves being long subulate, hairless, the upper cells longer and more confluent, the alar ones large and rectangular, the capsule shorter-pedicellate. Differs also from the related *Racomitrium Sudeticum* in the deeply cleft peristomial teeth, the narrow leaf-cells, &c.

St. Paul Island, Behring Sea. (*Palmer.*)

(294.) **R. lanuginosum,** Brid.

Near Venison Tickle, Labrador. (*Rev. A. Waghorne.*)

(295.) **R. canescens,** Brid.

On rocks, Seal Island and Venison Tickle, Labrador. (*Rev. A. Waghorne.*)

54. ULOTA, Mohr.

(319.) **U. intermedia,** Schimp.

Placentia Bay, White Bay and New Harbor, Newfoundland. (*Rev. A. Waghorne.*)

55. ORTHOTRICHUM, Hedw.

(326.) **O. anomalum,** Hedw.

On rocks at the Sulphur Springs, Banff, and at the east end of Devil's Lake, Rocky Mountains (*Macoun.*)

(328.) **O. nudum,** Dicks.

On limestone rocks, along the Ottawa River at Rockcliffe, April 16th, 1891. (*Macoun.*)

(946.) **O. Hallii,** Sulliv. & Lesq.; Lesq. & James, Mosses of N. America, 170.

On rocks (?) at Hector, Rocky Mountains. (*Macoun.*)

(345.) **O. brachytrichum,** Schimp.

On poplar trees on islands in the Columbia River at Revelstoke, B.C. (*Macoun.*)

(352.) **O. cylindrocarpum,** Lesq.

On rocks, "Dry Cañon," near the discharge of Devil's Lake, Rocky Mountains. (*Macoun.*)

56. ENCALYPTA, Schreb.

(363.) **E. vulgaris,** Hedw.

White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(947.) **E. Alaskana,** Kindb. (n. sp.)

Differs from *Encalypta longipes* principally in the capsule being striate and not apophysate, the peristome brown-red, appressed to the mouth in a wet state, the costa of the leaves nearly smooth. Monœcious. The lid of the capsule is obliquely rostrate. Calyptra not found. *Encalypta longipes* has an apophysate and quite smooth capsule, red peristome, always erect, and the costa very rough.

Mixed with a *Bryum* on earth, Ounalaska Island, Behring Sea, August 21st, 1891. (*J. M. Macoun.*)

(374.) **E. cucullata,** Kindb.

E. rhaptocarpa, Drumm. Musc. Bor.-Am., No. 52.

This is probably the above species. Rocks and banks, Rocky Mountains. (*Drummond.*)

58. TETRAPHIS, Hedw.

(376.) **T. pellucida,** Hedw.

Placentia Bay and White Bay, Newfoundland ; Deep Water Creek, Labrador. (*Rev. A. Waghorne.*)

62. TETRAPLODON, Bruch & Schimp.

(387.) **T. mnioides,** Bruch & Schimp.

Indian Harbor, Venison Tickle, Battle Harbor and Seal Island, Labrador. (*Rev. A. Waghorne.*)

(389.) **T. urceolatus,** Bruch & Schimp.

Near Indian Harbor, Labrador. (*Rev. A. Waghorne.*)

65. PHYSCOMITRIUM, Brid.

(948.) **P. platyphyllum,** Kindb. (n. sp.)

Lower leaves sublingulate, yellow-margined, serrate all around, with a percurrent costa ; the upper very broad, ovate-acuminate, indistinctly margined, serrate above the middle, costa percurrent or short-excurrent; cells wide subhexagonal, the basal subrectangular, all hyaline. Calyptra mitriform. Capsule pyriforme ; lid mammillate ; pedicel (unripe) yellow, about 1 cm. long or shorter.

On earth, Metcalfe street, Ottawa. (*Fletcher.*) Has been referred to, *P. pyriforme* on page 102.

67. BARTRAMIA, Hedw.

(407.) **B. ithyphylla,** Brid.

White Bay, Newfoundland; Battle Harbor, Indian Harbor, and Squaw Island, Labrador. (*Rev. A. Waghorne.*)

(409.) **B. pomiformis,** Hedw.

St. Paul Island, Behring Sea. (*Palmer.*) White Bay, Newfoundland. (*Rev. A. Waghorne.*)

69. PHILONOTIS. Brid.

(416.) **P. fontana,** Brid.

Battle Harbor, Labrador; White Bay, Newfoundland. (*Rev. A. Waghorne.*)

72. MEESIA, Hedw.

(420.) **M. uliginosa,** Hedw.

Battle Harbor, Labrador. (*Rev. A. Waghorne.*)

75. LEPTOBRYUM, Schimp.

(427.) **L. pyriforme,** Schimp.

Venison Tickle, and Battle Harbor, Labrador. (*Rev. A. Waghorne.*)

76. WEBERA, Hedw.

(433.) **W. nutans,** Hedw.

Venison Tickle, and Battle Harbor, Labrador; Harbor Deep, Newfoundland. (*Rev. A. Waghorne.*)

(446.) **W. cruda,** Schimp.

White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(452.) **W. albicans,** Schimp.

Battle Harbor, Labrador. (*Rev. A. Waghorne.*)

77. BRYUM, Dill.

(456.) **B. hæmatophyllum,** Kindb.

On wet rocks along Jupiter River, Anticosti. (*Macoun.*)

(460.) **B. pendulum,** Schimp.

B. cæspiticium, Drumm. Musc. Bor.-Am., No. 265, in part.

Battle Harbor and Seal Islands, Labrador. (*Rev. A. Waghorne.*) On cliffs along the Gaspé coast, Que. (*Macoun.*) Common in various situations. (*Drummond.*)

(472.) **B. uliginosum,** Bruch & Schimp.

Venison Tickle, and Fox Harbor, Labrador. (*Rev. A. Waghorne.*)

(474.) **B. intermedium,** Brid.

White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(480.) **B. pallescens,** Schleich.

B. turbinatum, Drumm. Musc. Bor.-Am., No. 266, in part.

Common in marshes and on moist banks. (*Drummond.*) Shore of Lake Huron at the Fishing Islands, and on earth at Owen Sound, Ont.; on earth at Câche Creek and Blackwater River, B.C. (*Macoun.*)

(949.) **B. alpiniforme,** Kindb. (n. sp.)

Allied to *Bryum alpinum*, in habit, the leaves chlorophyllose, the quadrate basal cells, and in the red costa, &c.; differs in the leaves being smaller, marginate, loosely disposed, more distinctly decurrent, borders reflexed nearly all around, and the cells wider, also the upper hexagonal-oval, and the costa often more excurrent. Barren.

On rocks, islands in Lake Nepigon, Ont., July 14th, 1884. (*Macoun.*)

(488.) **B. Raui,** Aust.

On rocks, Falls of St. Anne des Monts River, Gaspé Co., Que. (*Macoun.*)

(497.) **B. cæspiticium,** Linn.

White Bay, Newfoundland. (*Rev. A. Waghorne.*)
For Vesuvius Pickle on page 128, read Venison Tickle.

(507.) **B. obtusifolium,** Lindb.

St. Paul Island, Behring Sea. (*Palmer.*)

(508.) **B. erythrophyllum,** Kindb.

On wet limestone rocks along the Moira above the railway bridge at Belleville, Ont. (*Macoun.*) St. Paul Island, Behring Sea. (*Palmer.*)

(950.) **B. erythrophylloides,** Kindb. (n. sp.)

Nearly allied to *B. erythrophyllum*, agreeing in the leaves being loosely disposed, rose-red and not decurrent; differs in the leaves being quite immarginate, narrower, ovate-lanceolate, long-acuminate or acute; upper cells narrower; costa in the upper leaves somewhat long-excurrent, rigid. Barren.

By a spring in the Cypress Hills, Alberta, August 6th, 1880. (*Macoun.*)

The reference under *B. erythrophyllum* to the Illicillewaet Cañon belongs here.

(509.) **B pallens,** Swartz.

B. turbinatum var. *pallens*, Drumm, Musc. Bor..Am.. No. 267.

Moist banks, among the Rocky Mountains. (*Drummond.*) On earth at the "Gap," Bow River Pass, Rocky Mountain. (*Macoun.*)

(510.) **B. Duvalii,** Voit. var. **Caspeanum,** Kindb. (n. var.)

Differs in the leaves being narrow-lanceolate, short-decurrent, margined to the greater part, sometimes faintly denticulate above; costa percurrent or short-decurrent.

Wet rocks along the St. Anne des Monts River, Gaspé Co., Que., August 16th, 1882. (*Macoun.*)

(511.) **B. pseudo-triquetrum,** Schwaegr.

In bogs, Porcupine Mountain, Man.; Telegraph Trail, west of Quesnel, B.C.; numerous varieties are in the bogs around Banff, Rocky Mountains. (*Macoun.*) White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(516.) **B. meseoides,** Kindb.

On earth along Jupiter River and Gunn River, Anticosti; and on mountains north of Devil's Lake, Rocky Mountains. (*Macoun.*)

79. MNIUM, Linn.

(532.) **M. rostratum,** Schwaegr.

On stones in a brook, Deer Park, Lower Arrow Lake, Columbia River, B.C. (*Macoun.*)

(539.) **M. orthorrhynchum,** Bruch & Schimp.

Battle Harbor, Labrador. (*Rev. A. Waghorne.*) On rocks, "Dry Cañon," discharge of Devil's Lake, Rocky Mountains. (*Macoun.*)

82. TIMMIA, Hedw.

(562.) **T. Norvegica,** Zett.

On House Mountain, near Lesser Slave Lake, N.W.T. (*Macoun.*)

85. PSILOPILUM, Brid.

(574.) **P. arcticum,** Brid.

St. Paul Island, Behring Sea. (*Palmer.*)

86. POGONATUM, Beauv.

(577.) **P. dentatum,** Brid.

On earth along the Canadian Pacific Railway at Albert Cañon, Selkirk Mountains. (*Macoun.*)

Place *P. contortum*, Canadian Musci, No. 430, under *P. atrovirens*, as a synonymn.

87. POLYTRICHUM, Linn.

(595.) **P. commune,** Linn. var. **perigoniale,** Bruch & Schimp.

On banks in woods at Britannia, six miles west of Ottawa. (*Macoun.*)

NOTE.—*Polytrichum formosum*, Hedw.=*P. attenuatum*, Menz. ; Kindb. Laubm. Schwed. Novw. p. 54.

" *Polytrichum sylvaticum*, Menz.=*P. arcticum*, Swartz, Musc. Suec. =*P. ambiguum*, Michx.=*P. alpinum* var. *arcticum*," C. Mueller, synops. muscor. frond. I. p. 211.

89. BUXBAUMIA, Hall.

(951.) **B. indusiata,** D. E. Eaton, Coutl. Bot. Gaz. Vol.

On earth by rotten wood at Revelstoke ; and on rotten wood at Hastings, B.C. Referred to *B. aphylla* on page 157.

90. FONTINALIS, Dill.

(598.) **F. antipyretica,** Linn.

In the west end of Loughborough Lake near Kingston, Ont. (*Prof. Lawson.*)

91. DICHELYMA, Myrin.

(606.) **D. obtusulum,** Kindb.

Fredericton, N.B. (*Prof. Fowler.*)

98. PTERIGYNANDRUM, Hedw.

(623.) **P. filiforme,** Hedw.

White Bay, Newfoundland. (*Rev. A. Waghorne.*)

105. LESKEA, Hedw.

(637.) **L. nervosa,** Myrin.

White Bay, Newfoundland. (*Rev. A. Waghorne.*)

109. PYLAISIA, Bruch & Schimp.

(652.) **P. polyantha,** Bruch & Schimp.

White Bay and Harbor Deep, Newfoundland. (*Rev. A. Waghorne.*)

110. HOMALOTHECIUM, Bruch & Schimp.

(661.) **H. corticola,** Kindb.

Tufts dense, glossy. Stems pinnate, creeping; branches densely crowded, curved. Stem-leaves ovate, abruptly narrowed to the recurved or straight acumen; branch-leaves ovate-oblong acute or short-acuminate, straight; all leaves more or less denticulate and reflexed all around; alar cells quadrate, not numerous, the marginal ones also quadrate, the other oblong-rhomboidal, costa stout, vanishing above the middle; perichetial leaves entire, long-acuminate. Capsule cylindric-oblong, large, about 3 mm. long, slightly curved; teeth yellow; segments with a high basilar membrane; lid short-apiculate; pedicel rough, 1 cm. long. Monœcious.

Very much larger than *Homalothecium subcapillatum* and resembling *Camptothecium pinnatifidum.*

114. PSEUDOLESKEA, Bruch & Schimp.

(679.) **P. atrovirens,** Dicks.

On rocks, White Bay, Newfoundland. (*Rev. A. Waghorne.*)

115. HETEROCLADIUM, Bruch & Schimp.

(687.) **H. dimorphum,** Brid.

Seal Cove and Western Cove, White Bay, Newfoundland. (*Rev. A. Waghorne.*)

116. THUIDIUM, Schimp.

(695.) **T. gracile,** Bruch & Schimp.

White Bay, Newfoundland. (*Rev. A. Waghorne.*)

119. BRACHYTHECIUM, Schimp.

(734.) **B. Starkii,** Bruch & Schimp.

Western Cove and Coachman's Cove, White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(735.) **B. œdipodium,** Lesq. & James.

Cilia appendiculate; pedicel minutely rough.

Shaded ground, Fox River, and Ste. Anne des Monts River, Gaspé Co., Que. (*Macoun.*)

(736.) **B. curtum,** Lindb.

Grand Vâche, Newfoundland. (*Rev. A. Waghorne.*) Swamps, South-West Point, Anticosti. (*Macoun.*)

(737.) **B. reflexum,** Bruch & Schimp.

Little Bay Island, Harbor Deep and Western Cove, Newfoundland. (*Rev. A. Waghorne.*)

(751.) **B. populeum,** Bruch & Schimp.

White Bay, Newfoundland. (*Rev. A. Waghorne.*)

121. ISOTHECIUM, Brid.

(758.) **I. myosuroides,** Brid.

On stones and the bases of trees at Yarmouth, N.S., June 20th, 1883. (*Macoun.*)

(760.) **I. Cardoti,** Kindb.

Rhizome creeping; secondary stems pinnate, also ligneous, often curved, sometimes bearing rigid, long and at the apex branching flagella.

Stem-leaves ovate-lanceolate, subulate-acuminate, faintly denticulate below, the acumen serrate and twisted above; cells often yellowish, all long and narrow, except the basal, the alar and inner basal dark-yellow or orange, quadrate or rectangular; costa stout reaching to $\frac{2}{3}$; branch-leaves shorter-acuminate, sharply serrate above the middle, borders often faintly reflexed to the acumen. Perigonial leaves subovate, reddish at the base; costa fine and short; antheridia 3—4. Perichetial leaves nerveless, from a short, ovate base suddenly tapering to the much longer, subulate, acumen; vagina long-ciliate above. Capsule oval, horizontally patent or cernuous, teeth pale-yellow; segments rimose in the middle, prolonged into long and smooth cilia; pedicel smooth, about 1 cm. long, arcuate above. Monœcious.

This fine species differs from *I. myosuroides*, in the doubly larger leaves, the stout costa, the robust ligneous stem, the rigid flagella, &c.

122. EURHYNCHIUM, Schimp.

(771.) **E. Vaucheri,** (Schimp.)

On rocks, South-West Point, Anticosti; on rocks Lake Winnipegoosis, Man. (*Macoun.*)

(772.) **E. piliferum,** (Schreb.)

White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(778.) **E. Stokesii,** (Turn.)

Little Bay Island, Newfoundland. (*Rev. A. Waghorne.*)

123. RAPHIDOSTEGIUM, Lesq. & James.

(786.) **R. Jamesii,** (Sulliv.)

Grande Vâche and Western Cove, White Bay, Newfoundland. (*Rev. A. Waghorne.*) On stones near Buckingham, Que. (*Macoun.*)

124. RHYNCOSTEGIUM, Schimp.

(790.) **R. deplanatum,** Schimp.

On earth at Truro, N.S. (*Macoun.*)

(791.) **R. serrulatum,** (Hedw.)

Seal Cove, Harbor Deep and Western Cove, Newfoundland. (*Rev. A. Waghorne.*)

126. PLAGIOTHECIUM, Schimp.

(952.) **P. decursivifolium,** Kindb. (n. sp.)

Hypnum latebricola, Canadian Musci, No. 304, in part.

Intermediate between *P. latebricola* and *P. pseudo-latebricola*. Agrees with the last in the branches being complanate, the leaves distichous, the capsule oblique ; differs in the leaves being broader, short-pointed, decurrent, the alar cells not distinct but the decurrent ones rectangular, the capsule in a dry state arcuate and finally furrowed, the lid longer often curved.

On cedar (*Thuya occidentalis*) stumps in a swamp, 5 miles west of Belleville, Ont. The specimens (fruiting) were named *P. Passaicense* by Austin, and probably distributed under that name by him. (*Macoun.*)

(953.) **P. attenuatirameum,** Kindb. (n. sp.)

Tufts green, faintly shining, loose, with few rhizoids. Primary stem very short; branches elongate, long-attenuate, finally flagelliform. Leaves subdistichous, the lower broadly ovate, obtuse or obtusate, entire long-decurrent, concave, recurved at the borders from the base to above the middle, at least at the one side ; cells chlorophyllose, somewhat dilated, the lowest very much wider and shorter, nearly uniform; costa generally short and double, rarely simple and reaching to the middle ; the other leaves gradually smaller, narrower and more acute or acuminate. Barren.

On rocks in Gilmour's Park, Chelsea, Que., September 6th, 1889. (*Macoun.*)

128. HYPNUM, Linn.

(836.) **H. hispidulum,** Brid.

White Bay, Newfoundland. (*Rev. A. Waghorne.*)

(873.) **H. fastigiatum,** Brid.

On trees in woods at Owen Sound, Ont. (*Macoun.*)

(874.) **H. hamulosum,** Bruch & Schimp.

On logs, Jupiter River, Anticosti ; on logs, Gaspé Co., Quebec. (*Macoun.*)

INDEX.

PAGE.

Acrocarpi 11
Aloina, C. Muell..... 49
Alsia, Sulliv..... 161
abietina, Sulliv..... 161
Macounii, Kindb..... 161
Amblyodon, Beauv..... 108
dealbatus, Beauv..... 108
Amblystegium, Schimp..... 216
adnatum, Hedw..... 220
compactum, Bruch & Schimp. 221
confervoides, Bruch & Schimp 218
curvipes, Guemb..... 220
dissitifolium, Kindb..... 220
distantifolium, Kindb..... 222
fenestratum, Kindb..... 217
fluviatile, Bruch & Schimp... 220
irriguum, Bruch & Schimp... 220
var. spinifolium, Lesq & James..... 220
minutissimum, Sulliv. & Lesq 216
orthocladon, Beauv..... 219
porphyrhizum, Schimp..... 219
riparium, Bruch & Schimp... 221
var. fluitans, Lesq. & James..... 222
serpens, Bruch & Schimp.... 218
serpens var. *Columbiæ*, Kindb.. 218
var. *lutescens*, Kindb..... 218
var. xanthodictyon, Kindb..... 218
speirophyllum, Kindb..... 217
Sprucei, Bruch & Schimp.... 217
subcompactum, C. M. & Kindb 221
subtile, Bruch & Schimp..... 217
tenuifolium, Kindb..... 217
vacillans, Sulliv..... 222
varium, Lindb..... 219
Wollei, Kindb..... 222
Yurtzkæ, Schimp..... 218
Amphoridium, Schimp. 80
caespitosum, Lesq. & James.. 81
Californicum, Lesq. & James. 80
Lapponicum, Schimp..... 80
Mougeotii, Schimp..... 80
Sullivantii, Can. Musc..... 80
Andreæa, Ehrh..... ...9, 256
alpestris, Schimp..... 10
Blyttii, Schimp..... 10
crassinervia, Bruch..... 10
Huntii, Limpr..... 10
Macounii, Kindb..... 10

PAGE.

nivalis, Hook..... 10
obovata, Thed..... 10
parvifolia, C. Muell..... 11
petrophila, Ehrh.....9, 256
petrophila var. *alpestris*, Thed. 10
Rothii, Web. & Mohr..... 10
Andreæaceæ 9
Angstrœmia, Bruch & Schimp... 20
longipes, Bruch & Schimp.... 20
Anictangium ciliatum, Drumm 78
imberbe, Drumm..... 78
Anodus Donianus, Bruch & Schimp 41
Anœctangium, Schwaegr..... 14
compactum, Schwaegr..... 14
Anomodon, Hook. & Tayl..... 170
apiculatus, Bruch & Schimp.. 171
attenuatus, Hueben..... 171
heterodeus, Kindb..... 172
obtusifolius, Bruch & Schimp. 171
rostratus, Schimp..... 170
viticulosus, Hook & Tayl.... 171
viticulosum, Drumm..... 171
Antitrichia, Brid..... 165
Californica, Sulliv..... 166
curtipendula, Brid..... 165
var. gigantea, Sulliv. & Lesq 165
tenella, Kindb..... 165
Archidium, Brid..... 12
Ohioense, Schimp..... 12
Arrhenopterum heterostichum, Drumm 146
Astomum, Hampe..... 12
crispum, Hampe..... 12
Drummondii, Kindb..... 12
Atrichum, Beauv..... 147
angustatum, Bruch & Schimp. 147
crispum, James..... 148
leiophyllum, Kindb..... 148
Lescurii, James..... 147
parallelum, Mitt..... 148
rosulatum, C. M. & Kindb... 148
Selwynii, Aust..... 147
undulatum, Beauv..... 147
xanthopelma, Can. Musc..... 148
Aulacomnieæ..... 144
Aulacomnium, Schwaegr 144
androgynum, Schwaegr..... 144
heterostichum, Bruch & Schimp 146

PAGE.

palustre, Schwaegr.... 144
var. imbricatum, Bruch & Schimp.... 145
var. laxifolium, Kindb... 145
var. polycephalum, Bruch & Schimp.... 145
turgidum, Schwaegr.... 145
Barbula, Hedw.... 49, 263
aciphylla, Bruch & Schimp. 59, 265
alpina, Bruch & Schimp.... 58
ambigua, Bruch & Schimp... 49
amplexa, Lesq.... 51
amplexa.... 62
angustata, Wils.... 58
brachyangia, C. M. & Kindb. 59
brachyphylla, Sulliv. var. angustifolia, Kindb.... 55, 264
brevirostris, Bruch & Schimp. 50
cæspitosa, Schwaegr.... 51, 263
carnifolia, C. M. & Kindb.... 52
carnifolia.... 60
chrysopoda, C. M. & Kindb.. 57
circinnatula, C. M. & Kindb.. 56
convoluta, Hedw.... 57
var. obtusata, Kindb.... 265
cylindrica, Tayl.... 57
cylindrica, Can. Musc.... 56
cylindrica, Schimp.... 56, 264
decursivula, Kindb.... 264
elata.... 56
fallax, Hedw.... 53, 263
fallax.... 54, 55
flexifolia, Can. Musc.... 56
fragilis, Bruch & Schimp.... 51
gracilis, Schwaegr.... 52
gracilis var. *squanulosa*, Kindb 53
horridifolia, C. M. & Kindb... 57
horridifolia.... 56
icmadophila, Bryol. Europ.... 53
inclinatula, C. M. & Kindb... 50
inclinata, Hedw.... 51
lævipila, Bruch & Schimp.... 59
lævipila, Can. Musc.... 60
laeviuscula, Kindb.... 265
lato-excisa, C. M. & Kindb.... 60
lato-excisa, C. M. & Kindb.... 59
leptotricha, C. M. & Kindb... 60
macrorhyncha, Kindb.... 50
megalocarpa, Kindb.... 59, 265
melanocarpa, C. M. & Kindb.. 54
mucronifolia, Bruch & Schimp 58
Muelleri, Bruch & Schimp... 60
nitidum, Jur.... 52
cœnea, C. M. & Kindb.... 55
papillinervis, C. M. & Kindb. 60 266
platyneura, C. M. & Kindb.. 52
pseudo-rigidula, Kindb.... 264
recurvifolia, Schimp.... 54
rigida, Schultz.... 49
rigida.... 50

PAGE.

rigidula, Schimp.... 54
rigidula, Can. Musc.... 55
robustifolia, C. M. & Kindb.. 56
robustifolia, C. M. & Kindb... 55
rotundo-emarginata, C. M. & Kindb.... 60
rubiginosa, Mitt.... 55
rubiginosa, Can. Musc.... 56
rufa, Lov.... 55
ruralis, Hedw.... 58, 265
spadicea, Mitt.... 55, 264
sparsidens, C. M. & Kindb... 54
subcarnifolia, C. M. & Kindb. 52
subgracilis, C. M. & Kindb. 53, 263
subicmadophila, C. M. & Kindb.... 53
subicmadophila.... 54
subulata, Beauv.... 57
subulata var. *angustata*, Schimp 58
subulata var. longifolia, Kindb 58
tortellifolia, C. M. & Kindb.. 56
tortuosa, Web. & Mohr.... 50, 263
tortuosa.... 51
unguiculata, Hedw.... 55
virescens.... 56
Vahliana, Schultz.... 51
vinealis, Braun.... 263
Bartramia, Hedw.... 104, 270
breviseta, Lindb.... 106
circinnulata, C. M. & Kindb.. 105
fontana, Drumm.... 106
glaucoviridis, C. M. & Kindb. 105
gracilis, Drumm.... 104
Halleriana, Hedw.... 105
ithyphylla, Brid.... 104, 270
Menziesii, Turn.... 104
Œderiana, Swatz.... 104
Œderiana var. minor, Kindb. 105
pomiformis, Hedw.... 105 270
subulata, Bruch & Schimp... 104
Bartramieæ.... 104
Blindia, Bruch & Schimp.... 42
acuta, Bruch & Schimp.... 42
Brachythecium, Schimp.... 190
acuminatum, Beauv.... 191
var. setosum, Sulliv. & Lesq.... 192
acutum, Sulliv.... 193
albicans, Bruch & Schimp... 194
asperrimum, Mitt.... 200
campestre, Bruch & Schimp.. 200
cirrhosum, Schimp.... 194
collinum, Bruch & Schimp... 196
Columbico-rutabulum, Kindb 198
curtum, Lindb.... 197, 275
cyrtophyllum, Kindb.... 191
digastrum, C. M. & Kindb.... 190
Donnellii, Aust.... 195
gemmascens, C. M. & Kindb. 195

PAGE.
glaciale, Bruch & Schimp.... 200
glareosum, Bryol. Europ..... 193
harpidioides, C. M. & Kindb. 194
laetum, (Brid)..... 190
lævisetum, Kindb..... 193
lamprochryseum, C. M. & Kindb..... 199
leucoglaucum, C. M. & Kindb. 198
mammilligerum, Kindb 192
mirabundum, C. M. & Kindb. 199
nanopes, C. M. & Kindb..... 201
œdipodium, (Mitt.).....197, 275
œdipodium, Can. Musc 197
platycladum, C. M. & Kindb. 195
plumosum, Bruch & Schimp.. 202
populeum, Bruch & Schimp 201 275
pseudo-albicans, Kindb..... 194
pseudo-collinum, Kindb 196
reflexum, Bruch & Schimp.197, 275
rivulare, Bruch & Schimp.... 200
var. obtusulum, Kindb... 201
*rivulare * Novæ-Brunsviciæ*, Kindb 201
Rœllii, Ren. & Card..... 193
rutabuliforme, Kindb 198
Rutabulum, Bruch & Schimp. 197
salebrosum, Bruch & Schimp. 192
spurio-acuminatum, C. M. & Kindb 191
spurio-rutabulum, C. M. & Kindb 197
Starkii, Bruch & Schimp..196, 275
trachypodium, (Brid.)..... 194
turgidum, Hartm 202
vallium, Sulliv. & Lesq 200
velutinum, Bruch & Schimp.. 196
Braunia, Bruch & Schimp..... 79
Californica, Lesq..... 79
var. pilifera, Lesq. & James..... 79

Bryeæ 110

Bryaceæ 11

Bryum, Dill.....118, 270
acutiusculum, C. Muell..... 135
affine, Drumm 138
alpiniforme, Kindb..... 271
alpinum, Linn..... 125
angustirete, Kindb..... 119
ancectangiaceum, C. M. & Kindb 130
archangelicum, Schimp..... 120
arcticum, Bruch & Schimp... 118
argenteum, Linn..... 127
var. lanatum, Bruch & Schimp 127
atropurpureum, Wahl..... 125
Atwateriæ, C. Muell..... 127
bimum, Schreb..... 123
var. angustifolium, Kindb 123

PAGE.
Blindii, Bruch & Schimp..... 125
brachyneuron, Kindb..... 120
Breidleri, Can. Musc..... 117
Brownii, Bruch & Schimp.... 119
bullatum, C. Muell..... 135
cæspiticium, Linn 128, 271
cæspiticium, Drumm..... 271
calophyllum, R. Br..... 121
capillare, Linn..... 130
var. brevicuspidatum. Kindb 131
capitellatum, C. M. & Kindb. 127
carneum, Drumm..... 117
var. *pulchellum*, Drumm.....115, 116
cirrhatum, Hoppe & Hornsch. 122
var. megalosporum, Kind 122
concinnatum, Spruce..... 135
cuspidatum, Drumm..... 136
cyclophyllum, Bruch & Schimp 131
dealbatum, Drumm..... 108
demissum, Drumm. 136
denticulatum, Kindb 133
Dohianum, Kindb..... 130
Duvalii, Voit 132
var. Gaspèanum, Kindb.. 272
var. lato-decurrens, C. M. & Kindb 132
Edwardsianum, C. M. & Kindb 120
elegans, Esenb 131
elongatnm, Drumm..... 116
erubescens, Kindb..... 118
erythrophylloides, Kindb ... 272
erythrophyllum, Kindb...131, 271
fallax, Milde..... 121
flexuosum, Aust..... 121
Froudei, Kindb 120
hæmatocarpum, C M. & Kindb..... 125
hæmatophyllum, Kindb..118, 270
heteroneuron, C. M. & Kindb. 130
hydrophilum, Kindb..... 133
inclinatum, Bruch & Schimp. 120
intermedium, Brid.....122, 271
Knowltoni, Barnes..... 124
Labradorense, Philib..... 122
lacustre, Brid..... 121
lato-decurrens, Can. Musc..... 132
leucolomatum, C. M. & Kindb. 123
lucidum, James..... 116
Macounii, Aust. 127
mamilligerum, Kindb..... 122
marginatum, Drumm 141
meseoides, Kindb 133, 272
microcephalum, C. M. & Kindb 134
microstegium, Bryol. Europ.. 123
microerythrocarpum, C. M. & Kindb 124
microglobum, C. M. & Kindb. 129
miniatum, Lesq..... 126

PAGE.

miniatum, Can. Musc..... 127
Muehlenbeckii, Bruch & Schimp 125
Muehlenbeckii, Lesq. & James. 125
murale, Can. Musc..... 124
nitidulum, Lindb..... 123
nutans. Drumm..... 112
nutans var. *minor*, Drumm... 116
obconicum, Can. Musc..... 130
obtusifolium, Lindb 131, 271
occidentale, Can. Musc..... 122
œneum, Blytt..... 121
oligochloron, C. M. & Kindb. 129
Ontariense, Kindb..... 135
pallens, Swartz.....132, 272
pallescens, Schleich.....123, 271
var. longifolium, Kindb.. 124
var. laxifolium, Kindb... 124
palustre, Drumm 144
pendulum, Schimp 119, 271
percurrentinerve, Kindb..... 126
percumcentinerve, Kindb..... 126
provinciale, Can. Musc..... 130
pseudotriquetrum.
Schwaegr 132, 272
var. hyalodontium, C. M. & Kindb..... 133
punctatum, Drumm..... 142
purpurascens, Bruch & Schimp..... 119
pygmæo-alpinum, C. M. & Kindb 126
pyriforme, Drumm..... 110
Raui, Aust.....125, 271
roseum, Schreb..... 134
rubicundulum, C. M. & Kindb 129
rutilans, Bruch & Schimp..... 116
Schleicheri, Schwaegr..... 134
simplex, Kindb..... 135
spinosum, Drumm..... 141
squarrosum, Drumm..... 110
stenotrichum, C. Muell..... 135
subpurpurascens, Kindb..... 119
subrotundum, Brid..... 124
synoico-cæspiticium, C. M. & Kindb 128
terès, Lindb..... 124
torquescens, Bruch & Schimp 134
trichodes, Drumm..... 109
var. *longiseta*, Drumm.... 108
var. *minor*, Drumm..... 109
triquetrum, Drumm..... 109
turbinatum, Schwaegr..... 133
turbinatum, Drumm.....123, 271
var. *pallens*, Drumm..... 272
turgidum, Drumm..... 145
uliginosum, Bruch & Schimp 121, 271
Vancouveriense, Kindb..... 129
Warneum, Can. Musc..... 120

PAGE.

Zierii, Drumm 136
Buxbaumia, Hall.....157, 273
aphylla, Linn..... 157
indusiata, D.C. Eaton 273
Calliergon, Lesq. & James..... 245
Camptothecium, Schimp..... 188
æneum, Mitt..... 188
Amesiæ, Ren. & Card..... 188
aureum, Schleich..... 190
fulgescens, Mitt..... 188
hamatidens, Kindb..... 189
var. tenue, Kindb..... 189
lutescens, Bruch & Schimp... 188
megaptilum, Can. Musc..... 200
Nevadense, Lesq..... 188
nitens, Schimp..... 189
Nuttallii, Bruch & Schimp... 188
Campylium, Linn..... 222
Campylopus, Brid..... 35
Schimperi, Milde..... 35
Campylosteleum, Bruch & Schimp 42
saxicola, Bruch & Schimp... 42
Catoscopium, Brid..... 108
nigritum, Brid..... 108
Ceratodon, Brid.....38, 261
conicus, Lindb..... 39
heterophylla, Kindb..... 261
minor, Aust..... 39
purpureus, Brid.....38, 261
var. xanthopus, Sulliv... 39
Ceratodonteæ..... 38
Cinclidium, Swartz..... 144
stygium, Swartz..... 144
stygium, Drumm..... 143
subrotundum, Lindb..... 144
subrotundum, Can. Musc..... 144
Cinclidotus, Beauv..... 61
fontinaloides, Beauv..... 61
Climacium, Web. & Mohr..... 178
Americanum, Brid..... 178
dendroides, Web. & Mohr... 178
Ruthenicum, Lindb..... 179
Conomitrium, Mont..... 38
Hallianum, Can. Musc..... 38
Julianum, Mont..... 38
Conostomum, Swartz 106
boreale, Swartz..... 106
Coscinodon, Spreng..... 79
pulvinatus, Spreng..... 79
Cratoneuron, Sulliv..... 230
Ctenidium, Mitt..... 233
Ctenium, Sulliv..... 233
Cylindrothecium, *brevisetum*, Bruch & Schimp..... 177
cladorrhizans, Schimp,..... 176
compressum, Bruch & Schimp. 178
Drummondii, Can. Musc..177, 245
seductrix, Sulliv..... 178

PAGE.
Cynodontium, Schimp. 16, 257
alpestre, Wahl ... 16
gracilescens, Schimp ... 16
gracilescens, Can. Musc ... 17
var. *alpestre*, Schimp. ... 16
polycarpum, Schimp ... 17
polycarpum, var. *strumiferum*, Schimp ... 17, 257
Schisti, Schimp ... 16
strumiferum, De Not ... 17
strumulosum, C. M. & Kindb. 16
subalpestre, Kindb ... 17, 257
virens, Schimp ... 17, 257
var. serratum, Bruch & Schimp ... 18, 257
var. *Wahlenbergii*, Bruch Schimp ... 18
Wahlenbergii, (Brid) ... 18, 257
var. compactum, (Schimp) ... 18, 257
Desmatodon, Brid ... 47, 263
atrovirens, Smith ... 48
camptothecius, Kindb ... 48
cernuus, Bruch & Schimp. ... 48
var. xanthopus, Kindb ... 48
latifolius, Brid ... 47, 263
latifolius, Can. Musc ... 48
Laureri, Bruch & Schimp. ... 49
nervosus, Bruch & Schimp. ... 48
nervosus, Lesq. & James ... 48
obliquus, Bruch & Schimp. ... 49
obtusifolius, Schimp ... 48
Porteri, James ... 47
subtorquescens, C. M. & Kindb ... 48
Systylius, Bruch & Schimp. ... 47
Dichelyma, Myrin ... 159, 274
capillaceum, Bruch & Schimp. 160
var. elongatum, Kindb. 160
cylindricarpum, Aust ... 160
longinerve, Kindb ... 230
Novæ Brunsvicæ, Can. Musc. 159
obtusulum, Kindb. ... 159, 274
pallescens, Bruch & Schimp. 160
uncinatum, Mitt ... 160
Dichodontium, Schimp ... 19, 258
flavescens, Lindb ... 19
pellucidum, Schimp ... 19, 258
var. fagi-montanum Braithw ... 19, 258
var. *serratum*, Schimp ... 19
Dicranella, Schimp ... 20, 258
cerviculata, Schimp ... 21
crispa, Schimp ... 20
Grevilleana, Schimp ... 20, 258
heteromalla, Schimp ... 22, 258
parvula, Kindb ... 21
rufescens, Schimp ... 22, 258
Schreberi, Schimp ... 20
var. *occidentalis*, Can. Musc 20

PAGE.
squarrosa, Schimp ... 21
subulata, Schimp ... 22, 258
varia, Schimp ... 21, 258
Dicranodontium, Bruch & Schimp 35
longirostre, Bruch & Schimp. 35
Dicranoweisia, Lindb ... 15, 256
cirrhata, Lindb ... 15
crispula, Lindb ... 15, 256
obliqua, Kindb ... 256
Dicranum, Hedw ... 23, 258
adiantoides, Drumm ... 37
albicans, Bruch & Schimp. ... 32
var. denticulatum, Kindb 261
angustifolium, Kindb ... 26, 259
arcticum, Schimp ... 23
Bergeri, Bland ... 33, 261
Blyttii, Bruch & Schimp ... 24
Bonjeani, De Not ... 32
Bonjeani, De Not ... 33
brachycaulon, Kindb. ... 34
brevifolium, Lindb ... 30, 260
bryoides, Drumm ... 35
Canadense, Kindb ... 30
Columbiæ, Kindb ... 32
congestiforme, C. M. & Kindb 29
congestum, Brid ... 29, 259
congestum, Brid ... 31
crispulum, C. M. & Kindb. ... 27
crispum, Drumm ... 20
dipteroneuron, C. Muell. ... 34
Drummondii, C. Muell. ... 33, 261
var. trachyneuron, Kindb ... 34, 261
Drummondii, C. Muell. ... 30
elongatum, Schwaegr. ... 31, 260
elongatum, Schwaegr. ... 25
var. *minor*, Drumm ... 24, 260
flagellare, Hedw. ... 25
fragilifolium, Lindb. ... 31, 260
fulvellum, Smith ... 23
fulvum, Hook ... 24
fuscescens, Turn ... 29, 259
var. brevirostre, Kindb. 30
fuscescens, Lesq. & James. ... 29
glaucum, Drumm ... 38
gracilescens, Aust ... 17
Grœnlandicum, Brid ... 31
Grœnlandicum, Limpr ... 31
heteromallum, Drumm. ... 22
hyperboreum, Smith ... 23
julaceum, Drumm ... 20
Labradoricum, C. Muell ... 25
latifolium, Drumm ... 47
leioneuron, Kindb ... 27
leucobasis, C. M. & Kindb. 30, 260
longifolium, Hedw ... 31
majus, Turn ... 27
majus, Turn ... 30
microcarpum, Drumm. ... 18
Miquelonense, Ren. & Card. 25

PAGE.

molle, Wils.....23, 258
montanum, Hedw.....24, 259
Muehlenbeckii, Bruch & Schimp.....30
neglectum, (Limpr.).....260
osmundoides, Turn.....37
palustre, Lesq. & James.....32
pellucidum, Drumm.....53, 258
plano-alare, C. M. & Kindb..31
polycarpum, Drumm.....257
rhabdocarpum.....29
Richardsoni, Drumm.....18
rugosum, Kindb.....33
var. *rugulosum*, Kindb...33
Sauteri, Schimp. var. pachytrichum, Kindb.....260
Schraderi, Web. &. Mohr.....33
Schreberianum, Drumm.....20
scoparium, Hedw.....28, 259
var. pallidum, C. Muell..29
var. scopariiforme, Kindb.....28, 259
scoparium, Hedw.....27, 33, 29
Scottianum, Drumm.....17
spadiceum, Zett.....260
spurium, Hedw.....34
spurium, Can. Musc.....34
Starkii, Web. & Mohr.....23, 259
var. *major*, Drumm.....33
stenodictyon, Kindb.....35
strictum, Schleich.....24, 27, 259
strictum, Drumm.....25
strumiferum, Drumm.....17
subbasilare, Drumm.....37
subpalustre, C. M. & Kindb.33, 261
subpalustre, C. M. & Kindb...30
subulatum, Drumm.....22
subulifolium, Kindb.....26
sulcatum, Kindb.....26, 259
tenuinerve, Zett.....25
tenuinerve, Zett.....25
undulatum, Turn.....34
undulatum, Turn.....33
undulifolium, C. M. & Kindb.32
varium, Drumm.....21, 20
virens, Hedw.....17
viride, Schimp.....25
viride, Schimp.....27
Didymodon, Hedw.....44, 262
cæspitosus, Mitt.....81
Baden-Powelli, Kindb.....262
Canadensis, Kindb.....44
capillaceum, Drumm.....39
cylindricus, Bruch & Schimp.45
flexicaule, Drumm.....46
fragile, Drumm.....51
glaucescens, Drumm.....46
heteromallum, Drumm.....46
inclinatum, Drumm.....40
Lappronicus, Mitt.....80

PAGE.

latifolium, Drumm.....48
luridus, Hornsch.....44
oblongifolium, Drumm.....48
purpureum, Drumm.....38
rigidulum, Drumm.....54
rubellus, Bruch & Schimp..44, 262
rufus, Lorentz.....44
trifarium, Drumm.....44
tortile, Drumm.....45
Diphyscium, Mohr.....157
foliosum, Mohr.....157
Dissodon, Grev. & Arn.....98
Frœlichianus, Grev. & Arn..98
Hornschuchii, Grev. & Arn..98
splachnoides, Grev. & Arn...98
Distichium, Bruch & Schimp..39, 262
capillaceum, Bruch & Schimp.....39, 262
inclinatum, Bruch & Schimp.....40, 262
Macounii, C. M. & Kindb....40
Drepanium, C. Muell.....234
Drummondia, Hook.....81
clavellata, Hook.....81
var. Canadensis, Kindb..81
Encalypta, Schreb.....93, 268
affinis, Drumm.....93
Alaskana, Kindb.....269
ciliata, Hedw.....94
ciliata, Drumm.....94
commutata, Nees. & Hornsch. 93
cucullata, C. M. & Kindb...96, 269
leiocarpa, Kindb.....95
leiomitra, Kindb.....94
longipes, Mitt.....95
Macounii, Aust.....94
procera, Bruch.....96
rhabdocarpa, Schwaegr.....93
rhabdocarpa, Schw. var *leiomitra*, Kindb.....94
Selwyni, Aust.....96
Spathulata, Can. Musc.....93
streptocarpa, Hedw.....96
streptocarpa, Drumm.....96
subspathulata, C. M. & Kindb. 93
vulgaris, Hedw.....93, 268
Entodon, C. Mueller.....176
acicularis, C. M. & Kindb....176
brevisetum, (Hook. & Wils)...178
cladorrhizans, C. Muell.....177
compressum, C. Muell.....178
expallens, C. M. & Kindb....177
Macounii, C. M. & Kindb....177
pallens, C. M. & Kindb.....177
seductrix, C. Muell.....178
Eubarbula, C. Mueller.....51
Eucladium, Bryol. Europ.....14, 256
verticillatum, Bryol. Europ.14, 256
Eugrimmia.....65
Ephemerum, Hampe.....11

PAGE.
minutissimum, Lindb..... 11
serratum, Hampe var. *angustifolium*, Schimp..... 11
Eurhynchium, Schimp.....205, 276
Boscii, (Schwaegr) 206
crassinerve, Schimp. var. laxorete, Kindb..... 207
Dawsoni, Kindb 206
diversifolium, Bruch & Schimp..... 205
hians, (Hedw.)..... 206
Oreganum, (Sulliv.) 207
piliferum, Bruch & Schimp 206, 276
prælongum, Bruch & Schimp. 206
semiasperum, C. M. & Kindb. 207
Stokesii, Bruch & Schimp. 207, 276
strigosum, Bruch & Schimp.. 205
substrigosum, Kindb..... 205
Sullivantii (Spruce)..... 206
Vaucheri, (Schimp)..... 205, 276

Fabroneæ..... 166
Fabronia, Raddi..... 166
pusilla, Raddi 166

Fissidenteæ..... 35
Fissidens, Hedw.....35, 261
adiantoides, Hedw.....37, 261
adiantoides, Hedw..... 37
var. brachyphyllum, Kindb..... 37
bryoides, Hedw..... 35
decipiens, De Not..... 37
exiguus, Sulliv..... 36
grandifrons, Brid 38
incurvus, Schwaegr..... 36
incurvus, Can. Musc..... 36
limbatus, Sulliv 36
minutulus, Sulliv..... 36
osmundoides, Hedw.....37, 261
pusillus, Wils..... 36
subbasilaris, Hedw..... 37
tamarindifolius, Don..... 36

Fontinaleæ..... 157
Fontinalis, Dill 157, 273
antipyretica, Linn 157, 273
var. gigantea, Sulliv..... 158
biformis, Sulliv..... 158
capillacea, Drumm..... 160
Dalecarlica, Bruch & Schimp. 158
disticha, Hook. & Wils..... 159
hypnoides Hartm..... 159
Kindbergii, Ren. & Card..... 158
Kindbergii, Can. Musc..... 158
Lescurii, Can. Musc 158
Neo-Mexicana, Sulliv. & Lesq 158
Novæ-Angliæ, Sulliv..... 159
squamosa, Linn..... 159
squamosa, Drumm..... 158
tenella, Ren. & Card..... 159

PAGE.
Funaria, Schreb..... 103
calcarea, Wahl..... 103
hygrometrica, Sibth..... 103
var. calvescens, Bruch & Schimp..... 104
Muhlenbergii, Drumm..... 103

Glyphomitrium, Brid..... 79
Canadense, Mitt..... 79

Grimmieæ..... 61
Grimmia, Ehrh.....62, 266
acicularis, Mitt..... 72
Agassizii, Lesq. & James.... 64
alpestris, Schleich.....70, 266
anodon, Bruch & Schimp.... 65
alpicola, Swartz.....63, 266
apocarpa, Hedw.....63, 266
apocarpa, Drumm..... 62
var. *gracilis*, Lesp. & James..... 63
var. *rivularis*, Lesq. & James..... 63
var. *stricta*, Drumm..... 62
arcuatifolia, Kindb. ... 69
atrata, Drumm..... 71
atricha, C. M. & Kindb..... 65
Californica, Can. Musc..... 67
calyptrata, Hook..... 71
canescens, Mitt..... 77
chloroblasta, Kindb..... 64
commutata, Heuben.....71, 266
commutata, Can. Musc..... 70
conferta, Funck..... 62
contorta, Bruch & Schimp.... 67
contorta, Wahl..... 67
coscinodontoides, Kindb..... 64
crassinervis, C. Muell.....64, 266
densa, Kindb..... 69
depilata, Kindb..... 69
Donniana, Smith..... 70
elatior, Bruch..... 68
elatior, Bryol Europ..... 70
elongata, Kaulf..... 71
funalis, Schimp..... 67
gracilis, Nees & Hornsch...63, 266
heterophylla, Kindb..... 64
Hookeri, Drumm..... 79
lanuginosa, Mitt..... 76
Manniæ, C. Muell..... 62
maritima, Turn.....64, 266
maritima, Can. Musc..... 64
microtricha, C. M. Kindb.... 70
mollis, Bryol Europ 71
montana, Bruch & Schimp.... 71
Muehlenbeckii, Schimp ...68, 267
nivalis, Kindb..... 66
Olneyi, Sulliv..... 69
ovata, Web. & Mohr.....70, 266
pachyneurula, C. M. & Kindb 65

PAGE.

patens, Mitt. 72
Pennsylvanica, Schwaegr. ... 71
plagiopodia, Hedw. 65
var. pilifera, Lesq. & James. 65
platyphylla, Mitt. 64
prolifera, C. M. & Kindb. 67
pulvinata, Smith 66
rivularis, Nees & Hornsh. 63, 266
sarcocalyx, Kindb. 66
Scouleria, Lesq. & James. 61
spirilis, Hook. & Tayl. 67
streptophylla, Laubm. 68
sulcata, Saut. 70
tenella, C. Muell. 66
torquata, Grev. 68, 266
tortifolia, Kindb. 68
trichophylla, Grev. 69
trichophylla 69
unicolor, Grev 71
varia, Mitt. 75

Gymnostomum, Hedw. 12, 256
calcareum, Nees & Hornsch. . 12
var. brevifolium, Schimp. 13
curvirostrum, Hedw. 13, 256
Heimii, vars. I, II, III, Drumm. 43
Lapponicum, Drumm. 80
latifolium, Drumm. 103
ovatum, Drumm. 42
phascoides, Drumm. 12
platyphyllum, Kindb. 13
pusillum, Drumm. 41
rupestre, Schwaegr. 13, 256
var. stelligerum, Schimp. 13
subsessile Drumm. 42
tenue, Schrad. 14
tortile, Drumm. 12
viridissimum, Drumm. 80
Harpidium, Sulliv. 226
Hedwigia, Ehrh. 78
ciliata, Ehrh. 78
var. leucophæa, Schimp. . 78
var. secunda, Schimp. ... 78
var. viridis, Schimp. 78
pilifera, Mitt. 79
subnuda, Kindb. 78
Heterocladium, Bruch & Schimp. 182
aberrans, Ren. & Card. 183
dimorphum, Brid. 182, 275
frullaniopsis, C. M. & Kindb. 183
heteropterum, Bruch. 182
homœopterum, C. M. & Kindb. 183
procurrens, Lesq. & James. .. 183
Vancouveriense, Kindb. 183
Heterophyllum, C. Muell. 239
Homalia, Brid. 163
Macounii, C. M. & Kindb. ... 163
obtusata, Mitt. 163
trichomanoides, Lesq. & James 163

PAGE.

Homalothecium, Bruch & Schimp. 175, 274
corticola, Kindb. 175, 274
pseudo-sericeum, Lesq. & James 175
pseudo-sericeum, Can. Musc. .. 188
sericeoides, C. M. & Kindb. .. 175
sericeum, Bryol. Europ. 176

Hookerieæ 166

Hylocomium, Schimp. 247
Alaskanum, Kindb. 248
brevirostre, Schimp. 248
calvescens, Lindb. 249
loreum, Schimp. 250
pyrenaicum, Lindb. 248
robustum, Kindb. 250
splendens, Schimp. 247
var. compactum, Lesq. & James 248
sqarrosum, Schimp. 249
var. calvescens, Lindb. .. 249
triquetrum, Schimp. 249
umbratum, Schimp. 248

Hypneæ 180

Hypnum, Linn. 222
abietinum, Linn. 186
var. *minor*, Drumm. 184
acuminatum, Beauv. 191
acuticuspis, Mitt. 204
acutum, Mitt. 193
adnatum, Hedw. 220
adnatum, var. Can. Musc. 220
aduncum, Drumm. 227
aduncum, Can. Musc. 226
var. *Kneiffii*, Schimp. 226
æneum, Mitt. 188
aggregatum, Mitt. 204
Alaskanum, Lesq. & James. .. 248
albicans, Neck. 194
Alleghaniense, C. Muell. 210
alpestre, Swartz. 243
amœnum, Drumm. 239
aplocladum, Mitt. 204
arcticum, Sommerf. 242
arcuatum, Lindb. 238
arcuatiforme, Kindb. 238
asperrimum, Mitt. 200
attenuatum, Drumm. 171
badium, Hartms. 245
badium, Hartms. 245
Bambergeri. Schimp. 239
Bigelowii, Sulliv. 211
Blandowii, Web. & Mohr. 186
Boscii, Schimp. 206
brevifolium, Lindb. 227
Brewerianum, Lesq. 204
byssirameum, C. M. & Kindb. 223
brevirostre, Ehrh. 248

PAGE.

cæspitosum, Brid 235
callichroum, Wils..... 202
campestre, Brid..... 200
Canadense, Kindb..... 236
catenulatum, Drumm..... 182
chloropterum, C. M. & Kindb. 231
chrysophyllum, Brid..... 223
circinale, Hook..... 235
circinale, Can. Musc..... 235
circulifolium, C. M. & Kindb.. 242
commutatum, Hedw..... 232
commutatum var. *falcatum* Brid..... 232
compactum, C. Muell..... 221
compactum, Can. Musc..... 221
complexum, Lesq. & James.. 237
collinum, Schleich. 196
Columbiæ, Kindb..... 224
Columbieo-palustre, C. M. & Kindb 241
confervoides, Drumm..... 217
confervoides, Brid..... 218
conflatum, C. M. & Kindb.... 230
cordifolium, Hedw 245
cordifolium, Drumm..... 246
Cossoni, Schimp..... 227
crispifolium, Hook 186
crista-castrensis, Linn..... 233
cupressiforme, Linn..... 237
cupressiforme, Drumm..... 235
cupressiforme var. *angustoribus*, Drumm 234
curvifolium, Hedw..... 238
cuspidatum, Linn..... 246
cylindricarpum, C. Muell..... 208
decipiens, (DeNot.)..... 232
decursivulum, C. M. & Kindb. 224
delicatulum, Linn..... 185
demissum, Wils..... 208
demissum, Can. Musc..... 208
denticulatum, Bruch & Schimp. 214
var. *Donianum*, Drumm.. 212
deplanatum, Schimp..... 209
dilatatum, Wils..... 241
diversifolium, Schimp..... 205
Donnellii, Aust..... 195
elegans, Hook 213
erectum, Drumm..... 191
eugyrium, Schimp 243
exannulatum, Guembel..... 228
falcatum, Brid..... 232
var. microphyllum, Kindb 232
fastigiatum, Brid 235, 277
fertile, Sendt..... 234
filicinum, Linn. 230
var. aciculinum, C. M. & Kindb..... 231
flaccum, C. M. & Kindb..... 240
Flemmingii, Lesq. & James... 250
fluitans, Linn..... 228

PAGE.

fluitans, Can. Musc..... 230
fluviatile, Swartz..... 220
geminum, Lesq. & James..... 212
giganteum, Schimp..... 246
Goulardi, Schimp 242
Goulardi, Can. Musc..... 243
gracile, Bruch & Schimp..... 184
Haldanianum, Grev..... 239
Halleri, Drumm..... 224
hamatidens, Kindb 189
hamulosum, Bruch & Schimp 235, 277
Heufleri, Jur..... 237
hians, Hedw..... .....206, 207
hispidulum, Brid.....222, 277
Jamesii, Lesq. & James 209
illecebrum, Schwaegr..... 203
illecebrum, Drumm..... 206
imponens, Hedw..... 236
intermedium, Lindb..... 227
irriguum, Lesq. & James..... 220
Kneiffii, (Bruch & Schimp)... 226
var. gracilescens, Bruch & Schimp..... 226
var. laxum, Kindb..... 226
var. platyphyllum, Kindb 226
var. rectifolium, Kindb.. 226
lætum, Brid..... 190
laxifolium, Schwaegr..... 187
latebricola, Bruch & Schimp.. 211
latebricola, Can. Musci....211, 277
lentum, Mitt..... 203
Lindbergii, Mitt..... 238
longinerve, Kindb..... 230
loreum, Linn..... 250
lutescens, Drumm..... 193
lutescens, Hedw..... 188
lycopodiodes, Schwaegr 227
Macounii, Kindb..... 224
medium, Drumm 168
microcarpum, C. Muell..... 209
minutissimum, Sulliv..... 216
minutulum, Hedw 184
molle, Lesq. & James 241
molluscum, Hedw..... 233
moniliforme, Drumm..... 167
montanum, Wils..... 243
Moseri, Kindb..... 229
Muehlenbeckii, Spruce..... 213
myosuroides, Linn..... 203
neckeroides, Hook..... 210
nemorosum, Koch..... 240
Nevadense, Lesq 188
nitens, Schreb..... 189
Norvegicum, Bruch & Schimp 242
Novæ-Angliae, Sulliv. & Lesq. 231
Novæ-Angliæ, Can. Musc..... 231
Nuttallii, Wils..... 188
Oakesii, Sulliv..... 248
obtusifolium, Hook..... 202

PAGE.

ochraceum, Turn..... 244
œdepodium, Mitt..... 197
Oreganum, Sulliv 207
orthocladon, Beauv 219
orthothecioides, Lindb..... 229
pallescens, Schimp..... 234
palustre, Huds..... 241
Passaicense, Lesq. & James... 211
piliferum, Schrad..... 206
pinnatifidum, Can. Musc..... 188
plicatile, Lesq. & James..... 237
plumosum, Swartz..... 202
polare, Lindb..... 242
polyanthos, Drumm..... 173
polygamum, Wils..... 225
populeum, Hedw..... 201
porphyrhizum, Can. Musc..... 219
prælongum, Lesq. & James.... 207
pratense, Hook..... 239
proliferum, Drumm..... 185
var. *compactum*, Drumm.. 185
pseudo-arcticum, Kindb..... 242
pseudo-drepanium, C. M. & Kindb 240
pseudo-fastigiatum, C. M. & Kindb 235
pseudo-montanum, Kindb... 243
pseudo-pratense, Kindb..... 239
pulchellum, Dicks..... 212
pulchellum, Drumm..... 212
puchellum, Can, Musc..... 212
pulchrum, Drumm.....191, 239
purum, Linn..... 246
radicale, Beauv..... 217
radicale, Drumm..... 219
recognitum, Hedw..... 185
recurvans, Schwaegr..... 208
reflexum, Starke..... 197
Renauldii, Kindb..... 238
reptile, Michx..... 234
revolutum, Lindb..... 237
revolvens, Swartz..... 227
revolvens, var. *intermedium*, Lesq. & James..... 227
Richardsoni, Mitt..... 246
riparium, Linn..... 221
rivulare, Bruch..... 200
var. *Novæ-Brunsviciæ* Kindb 201
robustum, Hook..... 250
rostratum, Drumm..... 170
rufescens, Drumm..... 179
rugosum, Linn..... 232
rugulosum, Drumm..... 232
rusciforme, Weis..... 210
Rutabulum, Linn..... 197
Rutabulum, Can. Musc..... 195
salebrosum, Drumm.....190, 194
salebrosum, Hoffm..... 192
sarmentosum, Wahl..... 246

PAGE.

Schreberi, Willd..... 247
scitum, Beauv..... 184
scorpioides, Schimp..... 245
scorpioides, Linn..... 245
Sendtneri, Can. Musc..... 230
Sendtneri, Schimp..... 226
Sequoieti, C. Muell..... 235
sericeum, Drumm..... 176
serpens, Linn..... 218
var. *compactum*, Drumm. 221
serrulatum, Hedw..... 210
Silesianum, Drumm..... 215
Sommerfeltii, Myrin..... 223
Sommerfeltii, Can. Musc..... 224
spiculiferum, Mitt.....203, 204
splendens, Hedw..... 247
Sprucei, Bruch & Schimp..... 217
squarrosum, Linn..... 249
Starkii, Brid..... 196
stellatum, Schreb..... 225
var. protensum, Bruch & Schimp 225
var. subdecursivulum, Kindb 225
stellatum, Drumm..... 225
var. *chrysophyllum*, Drumm 223
var. *polymorphum*, Drum. 223
Stokesii, Turn 207
stoloniferum, Hook..... 203
stramineum, Dicks..... 244
stramineum, Dicks..... 244
strigosum, Hoffm..... 205
subflaccum, C. M. & Kindb.. 240
subimponens, Lesq..... 236
var. cristula, Kindb..... 237
substrigosum, Can. Musc..... 205
subtile, Hoffm 217
Sullivantiæ, Schimp..... 215
Sullivantii, Spruce..... 206
sylvaticum, Huds..... 215
tenax, Drumm..... 181
torrentis, C. M. & Kindb..... 243
trichomanoides, Drumm..... 163
trichophorum, Spruce..... 212
trifarium, Web. & Mohr..... 244
trifarium, Web. & Mohr..244, 246
triquetrum, Linn..... 249
turfaceum, Lindb..... 213
turgescens, Schimp..... 245
turgescens, Schimp..... 245
umbratum. Can. Musc..... 248
umbratum, Ehrh..... 248
uncinatum, Hedw..... 228
var. micropterum, Kindb. 229
var. plumosum, Schimp.. 229
var. subestriatum, Kindb. 229
uncinatum var. *plumosum*, Can. Musc..... 221

PAGE.
undulatum, Linn..... 216
unicostatum, C. M. & Kindb.. 224
vacil ans, Lesq. & James 222
Vaucheri, Schimp..... 205
velutinum, Linn..... 196
vernicosum, Lindb..... 227
Waghornei, Kindb..... 234
Whippleannum, Sulliv 186
Wilsoni, (Schimp)..... 227
Zuratzkæ, Schimp..... 218
Zuratzkæ, Can. Musc..... 218
Isothecium, Brid 203, 275
acuticuspis, Lesq. & James... 204
aggregatum, Lesq. & James.. 204
aplocladum, Lesq. & James.. 204
Brewerianum, Lesq, & James. 204
Cardoti, Kindb 203, 275
Dawsoni, Kindb..... 209
lentum, Lesq. & James..... 203
myosuroides, Brid.....203, 275
myurellum, Kindb..... 204
spiculiferum, Lesq. & James. 204
stoloniferum, Brid,..... 203
Leptobryum, Schimp.....110, 270
pyriforme, Schimp. 110, 270
Leptodon, Mohr..... 161
nitidus, Lindb..... 161
trichomitrion, Mohr 161
Leptodontium, Hampe 45
Canadense, Kindb..... 45
Leptobarbula, Schimp..... 49
berica, Schimp..... 49
Leptotrichum, Hampe 45, 262
brevifolium, Kindb..... 46
flexicaule, Hampe..... 46
var. densum, Schimp.... 46
var. *densum*..... 40
glaucescens, Hampe.....46, 262
homomallum, Hampe..... 46
pallidum, Hampe..... 46
tenue, C. Muell..... 49
tortile, C. Muell..... 45
vaginans, Lesq. & James..... 45
Leskea, Hedw.....168, 274
crytophylla, Kindb..... 169
denticulata, Sulliv 170
nervosa, Myrin.....169, 274
var. *flagellifera*, Kindb... 172
nigrescens, Kindb..... 172
polycarpa, Ehrh..... 168
pulvinata, Wahl..... 170
subobtusifolia, C. M. & Kindb. 169
Wollei, Aust..... 170

Leskeeæ 166

Lescuræa, Schimp..... 170
imperfecta, C. M. & Kindb... 170

Leucobryeæ..... 38

Leucobryum, Hampe. 38
vulgare, Hampe..... 38

PAGE.
Leucodon, Schwaegr..... 164
brachypus, Brid..... 164
sciuroides, Schwaegr 164

Leucodonteæ 164

Limnobium, Bruch & Schimp.... 241
Macounia sciuroides, Kindb..... 180
Meesia, Hedw. ..... .108, 270
Albertinii, Bruch & Schimp.. 109
longiseta, Hedw..... 109
tristicha, Bruch & Schimp... 109
uliginosa, Hedw.....108, 270
var. alpina, Bruch & Schimp 109
var. minor, Bruch & Schimp 109

Meesieæ 108

Merceya..... 97
latifolia, Kindb 97
Meteorium, Brid..... 164
nigrescens, Mitt..... 164
Mielichhoferia, Hornsch..... 110
cuspidifera, Kindb 110
nitida, Nees & Hornsch. var. macrocarpa, C. Muell. .. 110
Mnium, Linn 136, 272
affine, Bland..... 138
Blyttii, Bruch & Schimp..... 142
cinclidioides, Heuben 142
cuspidatum, Hedw..... 136
var. tenellum, Kindb.... 136
decurrens, C. M. & Kindb.... 140
Drummondii, Bruch & Schimp 137
hornum, Linn..... 139
hymenophylloides, Heuben.. 143
hymenophyllum, Bryol. Europ 143
inclinatum, Lindb..... 141
insigne, Mitt..... 138
var. intermedium, Kindb 139
lycopodioides, Lesq. & James.. 140
macrociliare, C. M. & Kindb. 137
medium, Bruch & Schimp... 138
medium * *robustum*, Kindb.... 139
Menziesii, C. Muell 143
Nevii, C. Muell..... 137
Niagaræ, Kindb 141
orthorrhynchum, Bruch & Schimp 140, 272
orthorrhynchum, Can. Musc.140, 142
pseudo-lycopodioides, C. M. & Kindb 140
punctatum, Hedw..... 142
rostratum, Schwaegr 137, 272
rugicum, Laur 138
serratum, Brid..... 139
var. Macounii, Kindb.... 139
spinulosum, Bruch & Schimp. 141
steliare, Hedw..... 142
subglobosum, Bruch & Schimp 143

PAGE.

umbratile, Mitt..... 141
venustum, Mitt 137
Monocranum, C. Muell 35
dicranoides, C. Muell..... 35
stenodictyon, Kindb..... 35
Myurella, Bruch & Schimp..... 167
apiculata, Bruch & Schimp... 168
Careyana, Sulliv..... 168
gracilis, Lindb..... 168
julacea, Bruch & Schimp..... 167
Neckera, Hedw..... 161
complanata, Heuben 163
cladorrhizans, Drumm....178, 176
Douglasii, Hook..... 162
var. Macounii, Kindb.... 163
Menziesii, Drumm 161
var. amblyclada, Kindb.. 162
oligocarpa, Bruch & Schimp.. 162
oligocarpa, Can. Musc..... 162
pennata, Hedw 162
peterantha, C. M. & Kindb... 162
sericea, Drumm..... 172

Neckereæ 161

Œdipodium, Schwaegr..... 102
Griffithianum, Schwaegr..... 102
Oligotrichum, DC..... 149
aligerum, Mitt 149
hercynicum, DC..... 149
var. latifolium, C. M. & Kindb 149
Lyallii, Lindb..... 149
Oreoweisia, Schimp..... 15
serrulata, Schimp 15
var. tenuior, Kindb..... 15
Orthothecium, Bruch & Schimp.. 179
chryseum, Bruch & Schimp.. 179
chryseum 33
intricatum, Hartm..... 179
rubellum, Kindb 179
rufescens, Bruch & Schimp,.. 179

Orthotricheæ 79

Orthotrichum, Hedw.....86, 268
affine, Schrad..... 88
affine, Drumm. 88
alpestre, Hornsch..... 88
anomalum, Hedw. 86, 268
var. Americanum, Vent.. 86
anomalum, Drumm..... 86
Barthii, Sendtn..... 88
Blyttii, Schimp..... 87
brachytrichum, Schimp...90, 268
Braunii, Bruch & Schimp ... 89
Breutelii, Hampe..... 88
Canadense, Bruch & Schimp. 92
canum, Mitt..... 92
Columbicum, Mitt..... 91
connectens, Kindb..... 85
consimile, Mitt..... 90

PAGE.

consimile, Can. Musc..... 91
crispum, Drumm..... 84
cupulatum, Hoffm..... 87
var. minus, Sulliv..... 87
cupulatum, Drumm..... 87
cylindrocarpum, Lesq 91, 268
elegans, Schwaegr..... 89
fallax, Schimp 90
fallax, Schimp 90
Grœnlandicum, Berggr..... 88
Hallii, Sulliv. & Lesq..... 268
Hutchinsiæ, Drumm..... 83
Jamesianum, Sulliv..... 92
Killiasii, C. Muell..... 89
lævigatum, Zett..... 87
leiocarpum, Bruch & Schimp. 91
leiocarpum, Can. Musc..... 89
lonchothecium, C. M. & Kindb 90
lonchothecium, Can. Musc..... 90
Ludwigii, Drumm 81
Lyellii, Hook. & Tayl..... 92
var. papillosum, Lesq. & James 92
var. Pringlei, C. Muell... 92
nudum, Dicks 268
var. Rudolpianum, Schw. 87
obtusifolium, Schrad..... 92
obtusifolium, Drumm..... 90
Ohioense, Sulliv. & Lesq..... 89
pallens, Bruch 91
psilocarpum, James..... 89
psilocarpum, Can. Musc..... 89
psilothecium, C. M. & Kindb. 91
pulchellum, Brunton..... 91
Rœllii, Vent..... 90
rupestre, Schleich..... 88
rupincola, Drumm..... 88
Schimperi, Hamm..... 90
sordidum, Sulliv. & Lesq.... 89
speciosum, Nees..... 89
strangulatum, Beauv..... 90
striatum, Drumm..... 91
Sturmii, Hoppe & Hornsch.. 87
tenellum, Bruch..... 90
Texanum, Sulliv..... 87
var. globosum, Lesq..... 88
Texanum, Can. Musc..... 88
Venturi, Can. Musc..... 87
Watsoni, Can. Musc..... 88
Paludella, Ehrh..... 110
squarrosa, Brid..... 110
Pharomitrium, Schimp..... 42
subsessile, Schimp..... 42

Phasceæ 11

Phascum, Linn..... 11
crispum, Hedw..... 12
cuspidatum, Drumm..... 11
var. *piliferum*, Bruch & Schimp 11

UNIVERSITY OF CALIFORNIA

PAGE.
muticum, Drumm..... 11
piliferum, Schreb..... 11
serratum, Drumm..... 11
subexsertum, Hook..... 12
Philonotis, Brid.....106, 270
fontana, Brid.....106, 270
var. brachyphylla, Kindb 107
var. Columbia, Kindb... 107
var. microblasta, C. M. & Kindb.... 107
var. serrata, Kindb..... 107
glabriuscula, Kindb..... 107
leiophylla, Kindb..... 104
Macounii, Lesq. & James..... 106
marchica, Brid..... 106
Physcomitrieæ..... 102
Physcomitrium, Brid..... 102, 269
Hookeri, Hampe..... 103
Hookeri, Can. Musc..... 102
immersum, Sulliv..... 102
megalocarpum, Kindb..... 102
pyriforme, Brid..... 102
strangulatum, Kindb..... 103
turbinatum, C. Muell..... 103
platyphyllum, Kindb..... 269
Plagiothecium, Schimp..... 211
aciculari-pungens, C. M. & Kindb..... 216
Americanum, Kindb..... 211
attenuatirameum, Kindb.... 277
auriculatum, Kindb..... 215
bifariellum, Kindb..... 211
brevipungens, Kindb..... 215
denticulatum, Bruch & Schimp..... 214
var. lætum, Lesq. & James..... 214
var. squarrosum, Kindb. 214
dicursivifolium, Kindb..... 277
elegans, Schimp..... 213
geminum, Lesq & James.... 212
latetricola, Bruch & Schimp.. 211
membranosum, Kindb..... 215
Muehlenbeckii, Bruch & Schimp..... 213
Passaicense, Aust..... 211
pulchellum, Bruch & Schimp. 212
var. nitidulum, Lesq. & James..... 212
pseudo-latebricola, Hindb... 211
Silesiacum, Schimp..... 213
Sullivantiæ, Schimp..... 215
sylvaticum, Bruch & Schimp. 215
trichophorum, Spruce..... 212
turfaceum, Lindb..... 213
undulatum, Bruch & Schimp. 216
Platygyrium, Bruch & Schimp.... 172
orthoclados, Kindb..... 172
repens, Bruch & Schimp..... 172
PAGE.
repens var. *orthocladon*, Can. Musc..... 172
rupestre, Kindb..... 187
Pleurocarpi..... 157
Pogonatum, Beauv.....149, 273
alpinum, Roehl..... 151
var. brevifolium, Brid... 152
var. microdontium, Kindb 152
var. septentrionale, Brid. 152
atrovirens, Mitt.....151, 273
brevicaule, Beauv..... 149
capillare, Brid..... 150
capillare, Can. Musc..... 149
contortum, Lesq..... 150
contortum, Can. Musc....150, 273
dentatum, Brid 150, 273
erythrodontium, Kindb..... 150
Macounii, Kindb..... 152
polare, C. Muell..... 153
urnigerum, Beauv..... 151
urnigerum Drumm..... 150
urnigerum, Can. Musc..... 150
Polytricheæ..... 147
Polytrichum, Linn.....153, 273
alpestre, Drumm..... 155
alpinum, Drumm..... 151
var. *arcticum*, C. Muell... 273
ambiguum, Michx..... 273
angustatum, Drumm..... 147
attenuatum, Menz..... 273
boreale, Kindb..... 155
commune, Can. Musc..... 156
commune, Lindb..... 156
var. Canadense, Kindb... 156
var. *formosum*, Drumm.. 155
var. perigoniale, Bruch & Schimp.....156, 273
conorhynchum, Kindb..... 154
formosum, Hedw.....153, 273
gracile, Menz..... 153
grandifolium, Lindb..... 152
hyperboreum, R. Br..... 154
juniperinum, Willd..... 155
var. Waghornei, Kindb.. 155
Ohioense, Ren. & Card..... 153
pallidisetum, Drumm..... 156
pallidisetum var. Drumm..... 155
piliferum, Schreb..... 154
var. Hoppei, Rabenh.... 154
septentrionale, Drumm..... 152
sexangulare, Floerke..... 153
strictum, Banks..... 155
sylvaticum, Menz 273
undulatum, Drumm..... 148
urnigerum, Drumm..... 150
Pottia, Ehrh.....,42, 262
cavifolia, Ehrh..... 43
Heimii, Fuern 43, 262

PAGE.

Heimii, Fuern 43
heimioides, Kindb 43
intermedia, Fuern 43
latifolia, C. Muell 43
var, pilifera, C. Muell 43
littoralis, Mitt 43
riparia, Aust 43
truncata, Fuern 42
truncata, Can. Musc 43

Pottieæ 42

Pseudoleskea, Bruch & Schimp. 180, 274
atrovirens, Dicks 180, 274
var. atricha, Kindb 180
catenulata, Can. Musc 182
falcicuspis, C. M. & Kindb 182
malacoclada. C. M. & Kindb. 182
oligoclada, Kindb 180
radicosa, Mitt 181
var. *gracilis*, Lesq. & James 181
rigescens, Lindb 181
sciuroides, Kindb 180
var. denudata, Kindb 181
stenophylla, Ren. & Cardt 181

Psilopilum, Brid 149, 273
arcticum, Brid 149, 273
Pterigynandrum, Hedw 164, 274
filiforme, Hedw 164, 274
papillosulum, C. M. & Kindb. 165

Pterogonium, Swartz 165
brachypterum, Mitt 165
filiforme, Drumm 164
hirtellum, Drumm 167
intricatum, Drumm 172
trichomitrion, Drumm 161

Pterygophyllum, Brid 166
lucens, Brid 166
Ptychomitrium, Bruch & Schimp. 79
Gardneri, Lesq 79
incurvum, Sulliv 79

Pylaisia, Bruch & Schimp. 173, 274
filari-acuminata, C. M. & Kindb 174
heteromalla, Bruch & Schimp. 173
intricata, Bruch & Schimp ... 175
intricata, Can. Musc 174
Ontariensis, C. M. & Kindb .. 174
polyantha, Bruch & Schimp 173, 274
pseudo-platygyrium, Kindb.. 173
Selwynii, Kindb 174
velutina, Bruch & Schimp 175

Racomitrium, Brid 72, 267
aciculare, Brid 72, 267
affine, Lindb 74, 267
alternuatum, C. M. & Kindb. 73
brevipes, Kindb 77
canescens, Brid 77, 268

PAGE.

var. ericoides, Bruch & Schimp 77
var. lutescens, Lesq. & James 77
var. muticum, Kindb 77
fasciculare, Brid 75, 267
heterostichum, Brid 74, 267
var. *obtusum*, Kindb 75
lanuginosum, Brid 76, 268
Macounii, Kindb 73
microcarpum, Brid 76, 267
var. Palmeri, Kindb 267
micropus, Kindb 77
Nevii, C. Muell 72, 267
obscurum, Can. Musc 73
obtusum, Lindb 74
Oreganum, Ren. & Card 75
Oreganum 73
patens, Heuben 72
protensum, Braun 72
robustifolium, Kindb 73
speciosum, C. Muell 76
Sudeticum, Bruch & Schimp .. 74
Sudeticum, Can. Musc 74
varium, Lesq. & James 75, 73
varium, Can. Musc 75

Raphidostegium, Lesq. & James 208, 276
cylindricarpum, Lesq. & James 208
demissum, Lesq & James 208
Jamesii, Lesq. & James .. 209, 276
microcarpum, Lesq. & James. 209
recurvans, Lesq. & James 208
Rœllii, Ren. & Card 209
subadnatum, C. M. & Kindb. 209
subdemissum, Kindb 208
Rhabdoweisia, Bruch & Schimp. 16
denticulata, Bruch & Schimp. 16
fugax, Bruch & Schimp 16
Rhynchostegium, Schimp. .. 209, 276
aneuron, Kindb 215
deplanatum, Schimp 209, 276
rusciforme, Schimp 210
serrulatum, Lesq. & James 210, 276
Rhytidium, Sulliv 232
Schistidium 62
Schistostega, Mohr 98
osmundacea, Web. & Mohr .. 98

Schistostegeæ 98

Scleropodium, Schimp. 202
cæspitosum Bruch & Schimp. 202
illecebrum, Bryol Europ. 203
Krausei, C. Muell 203
obtusifolium, Kindb 202
Scouleria, Hook 61
aquatica, Hook 61
var. *nigrescens*, Kindb 61

PAGE.
var. *virescens*, Kindb 61
Muelleri, Kindb..... 62
Nevii, C. Muell..... 61
Seligeria, Bruch & Schimp..... 41
calcarea, Bruch & Schimp... 41
campylopoda, Kindb..... 41
Donii, C. Muell..... 41
pusilla, Bruch & Schimp..... 41
recurvata, Bruch & Schimp.. 41
var. arcuata, Lesq. & James..... 41
Seligerieæ..... 41
Senophyllum, C. Muell..... 52
Sphærangium, Schimp..... 11
triquetrum, Schimp..... 11
Sphagnaceæ..... 1
Sphagnum, Linn..... 1
acutifolium, Russ & Warnst. 3, 252
var. *fuscum*, Lesq. & James..... 2
var. *fuscum*, Can. Musc... 3
var. pallescens, Warnst. 4, 252
var. purpurascens, Warnst.....4, 252
var. rubrum, Warnst.... 252
var. versicolor, Warnst. 4, 252
compactum, DC.....7, 254
var. imbricatum, Warnst. 255
var. papillosum, Warnst. 7
var. squarrosum, Russ. 7, 255
var. subsquarrosum Warnst 7
cuspidatum, Russ. & Warnst
var. falcatum, Russ..... 5
var. Miquelonense, Ren. & Card..... 5
var. plumosum, Bryol Europ.....5, 254
var. submersum, Schpr.. 5
var. Torreyanum, Sulliv. 5, 254
cymbifolium, Ehrh.....8, 255
var. læve, Warnst..... 8
fimbriatum, Wils.....1, 251
fimbriatum, Wils..... 251
var. arcticum, C. Jenson. 1, 251
var. robustum, Warnst.. 251
var. tenue, Gravet..... 1
fuscum, Von Klinggraeff...2, 251
var. fuscescens, Warnst... 2
var. pallescens, Warnst. 3, 252
Garberi, Lesq. & James....7, 255
Girgenshonii, Russ.....1, 251
var. hygrophilum, Warnst 2
imbricatum, Russ..... 8
var. affine, Warnst..... 8
var. cristatum, Warnst. 8, 255
Labradorense, Warnst..... 253
Lindbergii, Schpr.....4, 253
PAGE.
medium, Limpr..... 256
var. læve, Russ..... 9
var. pallescens, Warnst.. 9
var. roseum, Warnst.... 9
Mendocinum, Sulliv. & Lesq. 6
molluscum, Bruch.....9, 256
papillosum, Lindb.....8, 255
var. intermedium, Warnst 255
var. læve, Warnst..... 9
var. sublæve, Limpr..... 9
Pylaiei, Brid..... 7
var. ramosum, Warnst. 7, 255
quinquefarium, Warnst....3, 252
rubellum, Wils..... 3
recurvum, Russ. & Warnst.. 253
var. amblyphyllum, Russ 5
vaf. mucronatum, Russ. 5, 254
var. parvifolium, Warst. 5, 254
var. pulchrum, Lindb..5, 254
riparium, Aongstr.....4, 253
rufescens, Bryol Europ.....8, 255
Russowii, Warnst.....2, 251
var. Girgensohnioides, Russ 2, 251
var. pœcilum, Warnst ... 2
var. rhodochroum, Russ. 2
squarrosum, Pers.....6, 254
var. imbricatum, Schpr. 6, 254
var. semisquarrosum, Russ 6, 254
var. speciosum, Russ.... 6
var. spectabile, Russ..... 6
strictum, Lindb..... 1
subsecundum, Nees.....8, 255
subnitens, Russ. & Warnst... 253
var. flavicomans, Card..4, 253
tenellum, Lesq. & James..... 9
tenellum von Klinggraeff.... 3
var. rubellum, Warnst..3, 252
var. violaceum, Warnst... 3
teres, Aongstr.....6, 254
var. imbricatum, Warnst. 6
var. squarrulosum, Lesq. 6
Warnstorfii, Russ.....3, 252
var. purpurascens, Russ.. 252
var. viride, Warnst..... 252
Wulfianum, Girg..... 7
var. macroclada, Warnst. 7
var. versicolor, Warnst.. 7
var. viride, Warnst..... 7
Sphlachneæ..... 98
Splachnum, Linn..... 100
ampullaceum, Linn..... 101
angustatum, Drumm..... 99
Frœlichianum, Drumm..... 98
var. *elongata*, Drumm.... 98
heterophyllum, Drumm..... 101
intermedium, Drumm..... 101
luteum, Linn..... 101

PAGE.

melanocaulon, Schw. 102
mnioides, Drumm. 100
rubrum, Linn. 101
sphæricum, Linn. 101
urceolatum, Drumm. 100
vasculosum, Linn. 101
Wormskioldii, Hornem. 100

Syntrichia, C. Muell. 57
Systylium sphlachnoides, Drumm. ... 98
Tayloria, Hook. 99
acuminata, Hornsch. 99
serrata, Bruch & Schimp. 99
splachnoides, Hook. 99
tenuis, Schimp. 99

Tetraphideæ 97

Tetraphis, Hedw. 97, 269
geniculata, Girgens. 97
pellucida, Hedw. 97, 269
Tetraplodon, Bruch & Schimp. 99, 269
angustatus, Bruch & Schimp. 99
australis, Sulliv. & Lesq. 100
mnioides, Bruch & Schimp. 100, 269
urceolatus, Bruch & Schimp. 100, 269
Thamnium, Schimp. 210
Alleghaniense, Bruch & Schimp. 210
alopecurum, Schimp. 210
Bigelowii, (Sulliv.) 211
Thelia, Sulliv. 166
asprella, Sulliv. 167
compacta, Kindb. 166
hirtella, Sulliv. 167
hirtella, Can. Musc. 166
Thuidium, Schimp. 184, 275
abietinum, Bruch & Schimp. .. 186
Blandowii, Bruch & Schimp. .. 186
crispifolium, Kindb. 186
decipiens, DeNot. 232
delicatulum, Mitt. 185
gracile, Bruch & Schimp. 184, 275
var. Lancastriense, Sulliv. & Lesq. 184
laxifolium, (Hook) 187
leskeoides, Kindb. 186
lignicola, Kindb. 185
minutulum, Bruch & Schimp. 184
recognitum, Lindb. 185
scitum, Aust. 184
var. lonchoneuron, Kindb. 184
Vancouveriense, Kindb. 183
Whippleanum, Kindb. 186
Timiella Vancouvericensis, Broth. 263
Timmia, Hedw. 146, 273
Austriaca, Hedw. 146
megapolitana, Hedw. 146
Norvegica, Zett. 146, 273

PAGE.

Timmieæ 146

Tortella, C. Muell. 50
Tortula brevirostris, Drumm. 50
bryoides, Drumm. 49
convoluta, Drumm. 57
fallax, Drumm. 53
humilis, Drumm. 51
ruralis, Drumm. 58
suberecta, Drumm. 49
subulata, Drumm. 57
tortuosa, Drumm. 50
var. *inclinata*, Drumm. .. 51
unguiculata, Hedw. 55
Trematodon, Michx. 19, 258
ambiguum, Hornsch. 19, 258
brevicollis, Hornsch. 20
Trichodon, Schimp. 39
cylindricus, Schimp. 39
Trichostomum, Smith. 47, 263
aciculare, Drumm. 72
fasiculare, Drumm. 75
flexipes, Bryol. Europ. 263
flexisetum, Limpr. 263
lanuginosum, Drumm. 76
microcarpum, Drumm. 76
patens, Drumm. 72
Sudeticum, Drumm. 74
tenue, Lesq. & James. 49
tophaceum, Brid. 47
Vancouvericense, Kindb. 263
Tripterocladium, C. Muell. 187
rupestre, Kindb. 187
Ulota, Mohr. 81, 268
Americana, Mitt. 83
Americana, Can. Musc. 83
Barclayi, Mitt. 85
Bruchii, Hornsch. 82
Bruchii, Can. Musc. 82
camptopoda, Kindb. 85
connectens, Kindb. 85
crispa, Brid. 84
crispa, Can. Musc. 84
var. *minor*, Lesq. 84
crispula, Brid. 84
curvifolia, Brid. 82
Drummondii, Brid. 81
Hutchinsiæ, Can. Musc. 83
intermedia, Schimp. 84, 268
Ludwigii, Brid. 81
maritima, C. M. & Kindb. 84
obtusiuscula, C. M. & Kindb. 82
phyllantha, Brid. 84
phyllantha, Mitt. 84
scabrida, Kindb. 83
subulata, C. M. & Kindb. 82
subulifolia, C. M. & Kindb. .. 82
Webera, Hedw. 111, 270
acuminata, Schimp. 111
albicans, Schimp. 117, 270

PAGE.

albicans, var. *deflexa* 113
annotina, Schwaegr. 116
Breidleri, Jur 117
canaliculata, C. M. & Kindb. 113
carnea, Schimp 115
Columbica, Kindb. 115
commutata, Schimp 117
cruda, Schimp 116, 270
cucullata, Schimp 113
cucullata, Can. Musc 111
Drummondii, Lesq. & James. 116
elongata, Schwaegr 111
fontana, Kindb 107
gracilis, Can. Musc 113
Lescuriana, Lesq. & James .. 115
longicolla, Hedw 112
Ludwigii, Schimp 117
var. microphylla, Kindb. 117
micro-apiculata, C. M. & Kindb 115
microcaulon, C. M. & Kindb. 114
micro-denticulata, C. M. & Kindb 114
nutans, Hedw 112, 270
var. macrospora, Kindb.. 113
nutans, var. *deflexa*, Kindb... 113
polymorpha, Schimp 111
polymorphoides, Kindb 111

PAGE.

pulchella, Schimp 115
pulchella, Can. Musc 115
pycno-decurrens, C. M. & Kindb 114
Schimperi, Schimp 116
sphagnicola, Schimp 113
subcucullata, C. M. & Kindb. 113
Tozeri, Schimp 117
Weisia, Hedw 14
acuta, Hedw 42
calcarea, Drumm 41
controversa, Drumm 14
convoluta, C. M. & Kindb 14
crispula, Hedw, ... 15
curvirostra, Drumm 4
latifolia, Drumm 43
macrocarpa, Drumm 110
nigrita, Drumm 108
Seligeri, Drumm 41
striata, Drumm 16
turbinata, Drumm 98
viridula, Brid 14

Weisieæ 12
Zieria, Schimp 136
demissa, Schimp 136
julacea, Schimp 136
Zygodon, Hook & Tayl 80
viridissimus, R. Br 80

PREFACE.

When Part VI. of the Catalogue of Canadian plants was published in 1892, there was sufficient material at hand to allow of the inclusion of the Lichens and Liverworts in that number, but there were still such large tracts of country in which no botanical work had been done that it seemed advisable to confine the scope of that volume to the Musci. The present part contains all the species of Lichens and Liverworts known to occur in Canada, and an addendum to Part VI. in which our knowledge of American Mosses north of the United States is brought up to date.

My collections of Hepaticæ were commenced in 1862, and the specimens were examined and my determinations verified by Mr. C. F. Austin, who continued to work at them up to the time of his death. There was then no one in America to whom I cared to send difficult species for determination, but shortly afterwards I made the acquaintance of Mr. C. M. Pearson, of Manchester, England, who undertook to examine my material. Mr. Pearson's work resulted in a pamphlet published in 1892, in which were enumerated all the species known to occur in Greenland, Canada and Alaska. The total number of species enumerated in the region covered by Mr. Pearson's list was 165.

For many years, difficult specimens were submitted to Prof. Underwood, who assisted me in many ways in my studies of Liverworts, and later Prof. A. W. Evans, New Haven, Conn., gave me valuable assistance, so valuable that without his help this section of the catalogue could not have been written at this time. Besides naming all my later collections, he carefully examined many doubtful specimens that had accumulated since the publication of Mr. Pearson's list, and I was thus enabled to give these doubtful species their proper place in the series.

During the lifetime of Prof. Tuckerman, all my collections of Lichens were examined by him, and after his death Dr. Eckfeldt, of Philadelphia, Pa., was of much assistance to me in my Lichen studies. In 1895 I opened up a correspondence with Rev. J. S. Deichmann Branth, of Sneptrup, Denmark, and by his kindness and assistance I have been enabled to complete my list of the rock Lichens, and those obscure forms grouped after Lecidea.

The addendum to Part VI. is compiled to agree in arrangement with the previous portion, and the generic names used therein, have for the same reason been kept almost unchanged. As in Part VI., Dr. Kindberg is my authority, unless otherwise stated, for the names of all species except those collected in Ontario in 1901, which were named by Mrs. E. G. Britton. I have, however, freely availed myself of the work of this lady, Dr. A. J. Grout, Dr. Best, Mr. Cheney and others.

Dr. Kindberg's work has been of immense service in increasing our knowledge of Canadian Bryology, as it was he, who, working with Dr.C. Mueller, made known the great wealth of species in our country, and by his invaluable assistance the writer was enabled to separate many new forms from the mass of material which had hitherto been overlooked or misnamed by other workers. A new impetus was given to collecting, and since the publication of Part VI., fully two hundred new forms have been added to our moss-flora. In Part VI, 953 species were enumerated ; in the addendum now published, the list is brought up to 1196, and only a few species have been discarded. It is quite true that some of Dr. Kindberg's species have been shown to be only forms of other species, but such corrections must be made in the work of all botanists, and some of his critics, in proportion to their published work, have been as great sinners in this respect as Dr. Kindberg. Dr. Kindberg's work was so far in advance of anything that had been done in Canadian Bryology before his time that there would be great injustice in withholding from him full credit for what he has accomplished.

Whenever genera have been monographed in recent years and the loan of our herbarium sheets has been asked, they have been freely lent, and in the body of the present work the changes made by the writers of these monographs have been indicated.

The specimens of cryptograms in the herbarium of the Geological Survey number over 16,000, so that it will be seen that the great majority of those referred to in Part VI and in the present catalogue are in our own herbarium. The writer has been the chief collector of these specimens, but many others have contributed to both knowledge and material. As the collector's name is in every case given after each citation, the amount of work done by each is evident and no special reference need be made to them here by name.

It should be noted that the word Labrador has in this, as in former catalogues, been used in the broad sense which includes the whole peninsula north of the province of Quebec. With the exception of the records credited to Mr. Waghorne, nearly every other Labrador reference is to Ungava District, which is bounded on the west by the Hudson Bay, on the north by Hudson Strait, on the east by the Atlantic Ocean, and on the south by the Province of Quebec.

JOHN MACOUN.

JUNE 12th, 1902.

HEPATICÆ.

ORDER I. RICCIACEÆ.

1. RICCIA, Micheli.

1. **R. arvensis,** AUST., Phil. Acad. Sc. XXI. 232.

On damp earth which has been covered by spring floods, east side of Leamy's Lake near Hull, Que., Sept., 24th, 1889. (*Macoun.*)

2. **R. lutescens,** SCHWEIN.

On the borders of muddy pools east of Belleville, Hastings Co., Ont., Aug. 13th, 1868. (*Macoun.*)

3. **R. Austinii,** STEPH.

Ontario. (*Underwood.*)

4. **R. fluitans,** LINN.

Very abundant in Patterson's Creek, Ottawa, Ont.; in the creek in the beaver meadow, west of Hull, Que.; very abundant in the marshes along the Bay of Quinte at Belleville, Ont., and on the south side of Massasauga Point, August 1st, 1873; in an old canal between Point Edward and Sarnia, Ont., August 14th, 1901; common in a pool at Sicamous, B. C. (*Macoun.*) In stagnant water near the round-house, Montrose, Ont., July, 1897. (*R. Cameron*)

5. **R. Sullivantii,** AUST.

On the muddy borders of pools east of Belleville, Hastings Co., Ont., July 16th, 1871; on a mud flat near McAdie's mill, Kennebec, Addington Co., Ont., July 11th, 1870. (*Macoun.*)

6. **R. sorocarpa,** BISCH.

Scoresby Sound, East Greenland, Lat. 70° 15′. (*C. Jansen.*)

2. RICCIOCARPUS, Corda.

7. **R. natans,** (Linn.) Corda.

In a stagnant pool near Montrose round-house, Ont., July, 1897. (*R. Cameron.*) In a pond near London, Ont. (*J. Dearness.*) In stagnant pools east of Beechwood, Ottawa, Ont.; also in pools at Belleville, Hastings Co., Ont.; in pools at Niagara Falls, May 13th, 1901; in pools at Port Heney, Fraser River, B.C.; common in a pool at Lost Lake, Cedar Hill, Victoria, Vancouver Island. (*Macoun.*)

Var. **terrestris.** (Scarcely distinct.)

On earth along the Ottawa and Lièvre rivers at their confluence near Buckingham, Que., 20 miles below Ottawa, Ont., Sept. 18th, 1892. (*Macoun.*)

Order II. MARCHANTIACEÆ, Liverworts.

3. TARGIONIA, Linn.

8. **T. hypophylla,** Linn.

Under sloping rocks, Pier's farm, and on damp rocks, Parson's Mountain, near Victoria, Vancouver Island, B.C., May 9th and 17th, 1893. (*Macoun.*)

4. PELTOLEPIS, Lindb.

9. **P. grandis,** Lindb.

Scoresby Sound, East Greenland, Lat. 70° 15′. (*C. Jansen.*)

5. SAUTERIA, Nees.

10. **S. alpina,** (Nees & Bischoff) Nees.

Collected at Behring Strait by the North Pacific Expedition under Commander Rodgers. (*Austin.*) On earth under rocks, Sulphur Mountain, Banff, July 16th, 1891, and under rocks at Lake Louise, Rocky Mountains, August 19th, 1891. (*Macoun.*) St. Paul Island, Pribyloff Group, Behring Sea, 1897. (*Howe.*) Scoresby Sound, Lat. 70° 15′, East Greenland. (*C. Jansen.*)

6. CLEVEA, Lindb.

11. **C. hyalina,** (SOMM.) LINDB.

Rittenbænk, Greenland. (*Vahl.*) On earth near the snow, mountain north of Kicking Horse Lake, Rocky Mountains, alt. 8,000 feet, July 21st, 1885 ; by a glacier in Roger's Pass, Selkirk Mountains, B.C., Aug. 24th, 1885; crevices of rocks at Revelstoke, west side of Columbia River, B.C., and in the Eagle Pass further west, May 23rd and 31st, 1890. (*Macoun.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

7. REBOULIA, Raddi.

12. **R. hemisphærica,** (LINN.) RADDI.

On calcareous earth on limestone rocks, Point Wilkins, Lake Winnipegosis, Man., July 16th, 1881 ; crevices of rock, Eagle Pass, B.C., May 31st, 1890. (*Macoun.*)

8. GRIMALDIA, Raddi.

13. **G. rupestris,** (NEES) LINDB.

On calcareous rocks at Rockliffe, Ottawa, Ont., 1884 ; in the crevices of limestone rocks, on the right bank of the Moira, above the railway bridge, Belleville, Hastings Co., Ont., June 16th, 1867. (*Macoun.*) Mount Albert, Gaspé Co., Que. (*Underwood.*)

14. **G. fragrans,** (BALB.) CORDA.

Collected in the Yukon River district by Funston in 1894. (*Evans.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

9. ASTERELLA, Beauv.

15. **A. Californica,** (HAMPE) UNDERW.

Fimbriaria Californica, Hampe.

On earth at Lytton, B.C., April 16th, 1889; on stones in a brook, Pass Creek, Columbia River, B.C., June 21, 1890. (*Macoun.*) Named by Dr. Underwood.

16. **A. violacea,** (Aust.) Underw.

Fimbriaria violacea, Aust. ; Pearson's List No. 149.

On wet soil on the summit of the mountain north of Kicking Horse Lake, Rocky Mountains, July 21st, 1885 ; at the glacier on the shoulder of Mount Tupper, Roger's Pass, Selkirk Mountains, B.C., Aug. 24th, 1885. (*Macoun.*)

17. **A. gracilis,** (Web. f.) Underw.

Fimbriaria pilosa, (Wahlenb.) Tayl.; Pearson's List No. 150.

Fimbriaria tenella, Nees ; Pearson's List No. 151.

Greenland. (*Vahl.*) On the upper slope of the mountain north of Kicking Horse Lake, Rocky Mountains, July 21st, 1885 ; on rocks west of Revelstoke, in the Eagle Pass, B.C. ; in the crevices of rocks on the mountains at Yale, B.C., May 17th, 1875 ; on rocks at Agassiz, B.C. ; on earth along Goldstream near Victoria, Vancouver Island ; at Comox, Vancouver Island ; on earth on rocks, Mount Erskine, Salt Spring Island, Gulf of Georgia, B.C., May 9th, 1887. (*Macoun.*) On earth, Chilliwack Lake, B.C., alt. 5,000 feet. (*J. M. Macoun.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

18. **A. fragrans,** (Schleich.) Trevis.

Telegraph Creek, northern British Columbia, May 27th, 1887. (*Dr. G. M. Dawson.*) It is probable that the specimens referred to *A. violacea* belong here. They were named as above by Mr. Pearson.

10. CONOCEPHALUM, Wiggers.

19. **C. conicum,** (Linn.) Dumort.

Hepatica conica, (Linn.) Michx. ; Pearson's List No. 165.

Along the Tobique River, N.B. (*Hay.*) On old logs in swamps, River Rouge, Argenteuil Co., Que. (*D'Urban.*) On wet rocks by brooks, Margaree, Cape Breton Island, N.S., July, 1898 ; quite common on old logs by brooks, fruiting abundantly, around Ottawa ; in shady swamps at Belleville, Hastings Co., Ont. ; on

old logs, Foster's Flats, Niagara Falls, May, 16th, 1901; wet woods, Hastings, Burrard Inlet, B.C.; on earth by a spring at Comox, Vancouver Island. (*Macoun.*) Prince of Wales Island, Alaska. (*J. M. Macoun.*) Juneau, Disenchantment Bay, Yakutat Bay, Unalaska, Farragut Bay and other parts of Alaska. (*Evans.*) Salmon Creek, Juneau, Alaska. (*Miss G. Cooley.*)

11. CYATHOPHORA, S. F. Gray.

20. **C. quadrata,** (Scop.) Trevis.

Preissia commutata, Nees.; Pearson's List No. 164.

Quite common on wet earth at Truro, N.S.; on wet limestone rocks, along the Gaspé coast, Que.; along Gunn River, Anticosti; on wet earth, Grand Narrows, Cape Breton Island, July, 1898; rocky banks near Belleville and along a small brook, Huntingdon, Hastings Co., Ont.; crevices of rocks, Foster's Flats, Niagara Falls, May 16th, 1901; wet ground along Lake Nipigon; on earth in many places along Lake Superior; on earth at the "Cave Mounds," Banff, Rocky Mountains; Hector and Lake Agnes, Rocky Mountains; in Crow's Nest Pass, Rocky Mountains, Alta.; on earth at Albert Cañon, Selkirk Mountains, B.C.; under wet rocks, Eagle Pass, Gold Range, B.C.; on rocks at Revelstoke, Columbia River, B.C.; on wet earth Kootenay Lake, B.C. (*Macoun.*) Cape Vancouver, Alaska. (*J. M. Macoun.*) Chilcat, Alaska. (*Krause.*) Juneau, Wrangell, Muir Glacier, Point Gustavus, mountains near Juneau, Alaska. (*Miss G. Cooley.*) Hooniah Village, Port Wells, and Coal Creek Hill, Alaska. (*Evans.*) Scoresby Sound, Lat. 70° 15′, and Hold-with-Hope, Lat. 73° 30′, East Greenland. (*C. Jansen.*)

12. MARCHANTIA, Linn.

21. **M. polymorpha,** Linn.

Godhavn, Greenland, June 25th, 1886. (*Rosenvinge.*) Labrador. (*Waghorne.*) On damp earth, Tobique River, N.B. (*Hay.*) On damp earth, Missinaibi River, northern Ontario. (*Dr. R. Bell.*) On earth, River Rouge, Argenteuil Co., Que. (*D'Urban.*) Cape Breton Island, N.S., and Woodstock, N.B.; in ditches at Truro, N.S.; on earth along the Gaspé coast, Que.; very common at Ottawa and Belleville and throughout Ontario; in swamps and wet woods, Nipigon River; on wet earth, Lake Manitoba, Man.,

1881 ; on wet earth in stream valleys, Cypress Hills, Assa. ; Jumping Pound Creek, Rocky Mountains, June, 1897 ; on earth in bogs, Eagle Pass, B.C. ; in ditches at New Westminster, Vancouver, and Hastings, B.C. ; wet places near Victoria, Goldstream and Cedar Hill, Vancouver Island. (*Macoun.*) On earth Kootenay Valley, Rocky Mountains, B.C. ; on earth at Adam's Lake, B.C. ; Upper Liard River, northern B.C. (*Dr. G. M. Dawson.*) Saskatchewan and Rocky Mountains. (*Bourgeau.*) Alaska. (*Krause.*) Glacier Bay, Orca, St. Paul Island, St. Matthew Island and Hall Island, Alaska. (*Evans.*) Nanaimo, Vancouver Island, also mountains near Juneau, Alaska. (*Miss G. Cooley.*) Unalaska. (*Evans.*) West Dawson, Yukon. (*Williams.*) East Greenland. The var. *alpestris*. (*C. Jansen.*)

Order III. METZGERIACÆ.

13. **METZGERIA, Raddi.**

22. **M. pubescens,** (Schrank) Raddi.

British Columbia. (*Lyall.*) Alaska. (*Krause.*) On boulders at Kicking Horse Lake, Rocky Mountains, B.C. ; on rocks in the Coast Range above Yale, B.C., May 17th, 1875 ; on trees at Hastings, Burrard Inlet, B.C., 1889. (*Macoun.*) On shaded rocks, Chilliwack River, B.C., 1901. (*J. M. Macoun.*) Gold Creek near Juneau, Alaska. (*Miss G. Cooley.*) On rocks at Cañon City, Alaska, March 27, 1898. (*Williams.*)

23. **M. myriopoda,** Lindb.

On damp rocks near Ironsides, Que., 5 miles from Ottawa, Ont., Oct. 21st, 1884. (*Macoun.*)

24. **M. conjugata,** Lindb.

On stones in McKay's woods at Ottawa, Ont., Oct. 9th, 1884 ; on rocks at Câche Lake, Algonquin Park, Ont., June 9th, 1900; on *Acer circinatum* at Hastings, Burrard Inlet, B.C. ; on damp rocks at Goldstream, near Victoria, Vancouver Island and at Qualicum and Comox, V.I. (*Macoun.*) Blankensop Bay, V.I. (*Dr. G. M. Dawson.*)

25. **M. hamata,** Lindb.

Gold Creek near Juneau, Alaska. (*Miss G. Cooley.*)

14. ANEURA, Dumort.

26. **A. latifrons,** LINDB.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) On earth, Salt Lake, Anticosti, August 10th, 1883 ; on dead wood at Baddeck and Margaree, Cape Breton Island, July, 1898 ; on old logs, Beechwood, Hemlock Lake and Britannia, near Ottawa ; on rotten wood, Otter Pond, near Brackley Point, Prince Edward Island ; on old stumps, Algonquin Park, Ont., July, 1900; on rotten wood, Hastings, Burrard Inlet, B.C. ; on old logs, in woods at Revelstoke, Columbia River, B.C. ; on dead wood, Parson's Mountain, Sea's farm, and Cedar Hill, near Victoria, Vancouver Island ; on wet logs at Nanaimo, V.I. ; on dead wood at Comox, V.I. ; very common. (*Macoun.*) Mt. Verstovia and Farragut Bay, Alaska. (*Evans.*)

27. **A. palmata,** (HEDW.) DUMORT.

On rotten stumps at Truro, N.S. ; on old logs in Dow's Swamp and at Beechwood, Ottawa, Ont. ; on rotten logs at Belleville, Hastings Co., Ont. ; on rotten wood at Hastings, Burrard Inlet, B.C. ; on rotten stumps, Cedar Hill, near Victoria, Vancouver Island ; also on old logs at Comox, V. I. (*Macoun.*) Prince of Wales Island, Alaska. (*J. M. Macoun.*)

28. **A. sessilis,** (SPRENGEL) DUMORT.

On old logs in a swamp at Carleton Place, near Ottawa, Ont., May 30th, 1884 ; on wet earth and on logs at Belleville, Hastings Co., Ont., July 12th, 1873. (*Macoun.*) This species is now included in the preceding by authors.

29. **A. pinnatifida,** NEES.

On wet earth in a road cutting, at the junction of the Sooke Lake Road, with that to Goldstream, near Goldstream, Vancouver Island, B.C., June 2nd, 1893. (*Macoun.*)

30. **A. pinguis,** (LINN.) DUMORT.

Umanakfjord, Greenland. (*Vanköffen.*) On wet earth at Gunn, St. Mary's and Becscie rivers, Anticosti ; on peat moss Mer Bleue, near Ottawa, June 15th, 1892 ; on roots and moss in

water, "Big Swamp," Murray, Northumberland Co., Ont., August 3rd, 1873; in a bog near the C. P. R. station at Banff, Rocky Mountains; in bogs, House Mountain, near Lesser Slave Lake, Atha.; on old logs in a swamp at Quesnel, B.C.; also on sticks in pools in woods at Comox, Vancouver Island. (*Macoun.*)

31. **A. multifida,** var. **ambrosioides,** (NEES) LINDB.

On earth in a swamp at Nanaimo, June 4th, 1887, and on earth in pools in woods at Comox, Vancouver Island, May 3rd, 1887. (*Macoun.*)

15. PALLAVICINIA, S. F. Gray.

32. **P. hibernica,** (HOOK.) S. F. GRAY.

On the bank of a creek in a beaver meadow, Huntingdon, North Hastings, Ont., September 8th, 1865; on wet limestone rocks at the head of Lake Louise, near Laggan, Rocky Mountains; on earth on the mountains north of Griffin Lake, Gold Range, B.C., August 10th, 1889. (*Macoun.*) Yakutat Bay, Alaska. (*Evans.*)

33. **P. Lyellii,** (HOOK.) S. F. GRAY.

On moss in a wet place, Canaan Forks, Queen's Co., N. B. (*J. Moser.*) Along a small brook, Sidney, Hastings Co., Ont., Sept. 17th, 1868; on the bank of a brook, Algonquin Park, Ont., Aug. 10th, 1900. (*Macoun.*)

16. PELLIA, Raddi.

34. **P. epiphylla,** (LINN.) CORDA.

Labrador. Collected by Waghorne. (*Underwood.*) Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) West Ledge, Canaan Forks, Queen's Co., N. B. (*J. Moser.*) Bass River, Kent Co., N.B. (*Prof. Fowler.*) On damp earth by roadsides, Brackley Point, Prince Edward Island; on earth and wet rocks at Baddeck, Margaree, Aspy Bay and Louisburg, Cape Breton Island, N.S.; on earth at Leamy's Lake, near Hull, Que., Sept. 24th, 1889; on earth by a brook, South Indian near Ottawa, Ont.; on earth in a bog near New Westminster, B.C.; on earth in a brook at Hastings, Burrard Inlet, B.C.; on stones and earth by a brook at

Comox, Vancouver Island, July, 1898. (*Macoun.*) Salmon Creek, Sitka, Alaska. (*Miss G. Cooley.*)

Sterile specimens of a *Pellia* referred to this species have been gathered on Sable Island, N.S., at Woodstock, N.B., and in Algonquin Park, Ont.

35. **P. endiviæfolia,** (DICKS.) DUMORT.

Labrador. Collected by Waghorne. (*Underwood.*) On earth in a ditch at Nanaimo and at Comox, Vancouver Island, June 4th, 1887. (*Macoun.*) St. Paul Island, Behring Sea, Aug. 18th, 1892. (*J. M. Macoun.*) Yakutat Bay, Alaska. (*Evans.*)

36. **P. Neesiana,** (GOTTSCHE) LIMPR.

Douglas Island, Juneau, Port Wells, Orca, and Yakutat Bay, Alaska. (*Evans.*)

17. BLASIA, Linn.

37. **B. pusilla,** LINN.

On earth by roadsides, Union Road, Brackley Point, Prince Edward Island; on wet rocks, Half-Way Brook, Cape Breton Island, July, 1898; on earth in a ravine at Woodstock, N.B., July, 1899; on earth along the Gaspé Coast, Que., Aug. 10th, 1882; on earth subject to inundations at Leamy's Lake, Hull, Que.; on wet clay banks, Meech's Lake, near Chelsea, Que.; clay banks at the mouth of the Lièvre River, Buckingham, Que.; not rare by lake shores, Algonquin Park, Ont., June, 1900; on earth along the Fraser River, Port Heney, B.C. (*Macoun.*) Juneau, Alaska. (*Evans.*)

18. FOSSOMBRONIA, Raddi.

38. **F. longiseta,** AUST.

On earth, Mount Erskine, Salt Spring Island, Gulf of Georgia, B.C., May 9th. 1887. (*Macoun.*)

39. **F. pusilla,** (LINN.) DUMORT.

Along the Addington Road near Flinton, Hastings Co., Ont., July 10th, 1870; on earth along Sproat Lake, eight miles above Alberni, Vancouver Island, August 12th, 1887. (*Macoun.*)

40. **F. foveolata,** LINDB.

Shores of Lake Nipissing, at North Bay, September 13th, 1889. (*Mrs. E. G. Britton.*) On earth subject to inundation, Leamy's Lake, near Hull, Que., September 24th, 1889 ; on earth by the Petewawa River, Algonquin Park, Ont., July, 1900 ; in the bed of the Bonnechère River at Golden Lake, Ont., September 27th, 1900 ; on old stumps subject to flood along Lake Duchesne above Britannia, near Ottawa, Ont., October, 29th, 1900 ; Craigallaichie, Eagle River, B.C., July 18th, 1889. (*Macoun.*)

41. **F. angulosa,** (DICKS.) RADDI.

On earth along Gull River, Victoria Co., Ont., July 28th, 1868. (*Macoun.*)

42. **F. Macounii,** AUST. Bot. Gaz. Vol. I. 36, 1876.

On earth and granitic sand along the lake at Methye Portage, (Portage La Loche) Lat. 57°, Athabasca, September 15th, 1875. (*Macoun.*)

ORDER IV. JUNGERMANNIACÆ.

19. GYMNOMITRIUM, Corda.

43. **G. obtusum,** (LINDB.) PEARSON.

Cæsia obtusa, Lindb. ; Pearson's List, No. 132.

Near Frederickshaab, Greenland. (*Vahl.*) On rocks, mountains north of Griffin Lake, B.C., August, 1889 ; on rocks, Mount Benson, near Nanaimo, Vancouver Island, July, 1893 ; on rocks, Pier's farm, Victoria, Vancouver Island, May, 1893. (*Macoun.*) Orca, Alaska. (*Evans.*)

44. **G. concinnatum,** (LIGHTF.) CORDA.

Cæsia concinnata (Dicks.) ; Pearson's List, No. 133.

Labrador, collected by Waghorne. (*Underwood.*) On earth, Asulcan Glacier, Selkirk Mountains, B.C. ; on rocks, mountains north of Griffin Lake, Gold Range, B.C. ; on rocks, Mount Mark, near Qualicum, Vancouver Island. (*Macoun.*) Alaska, near Chilcat. (*Krause.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

45. **G. corallioides,** NEES.

Cæsia corallioides, (Nees) S. F. Gray; Pearson's List, No. 131

Alaska. (*Krause.*) On rocks, Lake Lindeman, Yukon, and cañon above the lake, 1898. (*Williams.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

46. **G. crenulatum,** GOTTSCHE.

Alaska. Collected by Krause. (*Stephani.*)

47. **G. revolutum,** (NEES) SCHIFFON.

Greenland. (*Berggren.*)

20. MARSUPELLA, Dumort.

48. **M. emarginata,** (EHRH.) DUMORT.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) Labrador. Collected by Waghorne. (*Underwood.*) On wet ground in a gully at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On wet rocks by a brook, Margaree and Half-Way Brook, Cape Breton Island, Aug., 1898; on earth in bogs at Banff, Rocky Mountains; on stones in a brook, Roger's Pass, Selkirk Mountains, B.C.; on stones and wet earth on mountains north of Griffin Lake, B.C.; on rocks at Yale, Fraser River, B.C.; on damp rocks, North Arm, Burrard Inlet, B. C.; on rocks at Goldstream, near Victoria, Vancouver Island; on rocks, Mount Benson, near Nanaimo, Vancouver Island, alt. 3,000 feet, June 8th, 1887; on rocks, Mount Mark, near Qualicum, Vancouver Island, alt. 3,000 feet; on wet rocks, Mount Erskine, Salt Spring Island, Gulf of Georgia, B. C.; on earth at Nanaimo, Vancouver Island, June 4th, 1887. (*Macoun.*) Attu Island, Behring Sea. (*J. M. Macoun.*) Port Wells, Columbia Fiord, Unalaska and Juneau, Alaska. (*Evans.*) Sheep Camp, Alaska, and on rocks above Long Lake, B.C., 1898. (*Williams.*)

Var. **aquatica,** PEARSON.

Newfoundland. (*Pearson.*) This may be *M. aquatica*, Schiffner.

49. **M. sphacelata,** (GRISECKE) DUMORT.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) On wet rocks, Half-Way Brook, Cape Breton Island, N.S., Aug., 1898 ; on wet rocks near the lighthouse at Yarmouth, N.S., June 23rd, 1883 ; on wet rocks in brooks, mountains north of Griffin Lake, Gold Range, B.C. (*Macoun.*) Chilcat, Alaska. (*Krause.*)

50. **M. sparsifolia,** (LINDB.) DUMORT.

On wet rocks at Nanaimo, Vancouver Island, June 4th, 1887 ; on rocks, Mount Arrowsmith, Vancouver Island, alt. 4800 ft, July 17th, 1887. (*Macoun.*)

51. **M. densifolia,** (NEES) DUMORT.

On stones in brooks, on the mountains north of Griffin Lake, Gold Range, B.C., Aug., 7th 1889. (*Macoun.*)

21. NARDIA, S. F. Gray.

52. **N. compressa,** (HOOK.) S. F. GRAY.

Greenland. (*Vahl.*) On Atka Island, Aleutian Islands, Alaska, 29th Aug., 1891. (*J. M. Macoun.*)

53. **N. scalaris,** (SCHRAD.) S. F. GRAY.

Campo Bello Island, N.B., 1898. (*Prof. Farlow.*) On earth near Nanaimo, Vancouver Island, June 4th, 1887. (*Macoun.*) Yes Bay and Juneau, Alaska. (*Evans.*) Dawson, Yukon. (*Williams.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

54. **N. hæmatosticta,** (NEES) LINDB.

Disenchantment Bay, Hidden Glacier Inlet, St. Lawrence Island, Unalaska and Cape Nome, Alaska. (*Evans.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

55. **N. obovata,** (NEES) LINDB.

On stones at Glacier, Selkirk Mountains, B.C., Aug. 6, 1890. (*Macoun.*) Farragut Bay and Kadiak Island, Alaska. (*Evans.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

56. **N. crenulata,** (SMITH) LINDB.

Greenland. (*J. Vahl.*) On earth by a roadside, near Brackley Point, Prince Edward Island ; on earth at Truro, N.S., June 12th, 1883 ; on earth along roads at Baddeck and Aspy Bay, Cape Breton Island, N.S., July, 1898 ; on earth at Ottawa, Ont., 1883 ; on wet rocks at Yale, Fraser River, B.C.; on old logs, Stanley Park, Vancouver, B.C.; on sandstone rocks at Hastings, Burrard Inlet, B.C. ; on earth at Victoria, Vancouver Island, May 7th, 1875 ; on earth along Shawnigan Lake, Vancouver Island, and in a wet cutting of the railway close to that lake. (*Macoun.*)

22. GYROTHYRA, M. A. Howe.

57. **G. Underwoodiana,** M. A. HOWE.

On earth in a railway cutting, Hastings, B. C., April 6th, 1889 ; on wet rocks, North Arm, Burrard Inlet, near Hastings, B.C., April 29th, 1889. (*Macoun.*)

23. PRASANTHUS, Lindb.

58. **P. suecicus,** (GOTTSCHE) LINDB.

Scoresby Sound, Lat. 70° 15′, East Greenland. (*C. Jansen.*)

24. ARNELLIA, Lindb.

59. **A. fennica,** (GOTTSCHE) LINDB.

On limestone rocks at the Narrows, Lake Manitoba, June 16th, 1881 ; on earth and logs, Kicking Horse Lake, Rocky Mountains, July 23rd, 1885. (*Macoun.*)

25. JUNGERMANNIA, Linn.

60. **J. autumnalis,** DC.

Greenland. (*Vahl.*) Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) On logs, Tobique River, N.B. (*Hay.*) On old logs at Pictou and Truro, N.S.; on old logs, Margaree, Cape Breton Island, N.S., July, 1898 ; on rotten wood at Otter Pond, near Brackley Point, Prince Edward Island ; on logs, Mount Albert, Gaspé Co., Que.; quite common at Woodstock, N.B., July, 1899 ;

quite common on old logs in Algonquin Park, Ont., June, 1900; quite common on dead wood at Ottawa, Ont.; at Belleville, Hastings, Co., Ont.; on old logs, Sudbury Junction, Algoma, Ont.; on logs at Owen Sound, Ont.; on old logs near Lesser Slave Lake, Atha.; on earth at the Cave Mounds, Banff, Rocky Mountains; quite common on old logs at Revelstoke, Columbia River, B.C.; on logs at Sicamous, Shuswap Lake, B.C.; on rotten logs at Agassiz, B.C.; on logs, near Union Mines, Comox, Vancouver Island. (*Macoun.*)

61. **J. sphærocarpa,** Hook.

Labrador. Collected by Waghorne. (*Underwood.*) On earth in the vicinity of Victoria, Vancouver Island, May 7th, 1875; on wet earth on the shore of Shawnigan Lake, Vancouver Island, May 26th, 1893. (*Macoun.*) Hooniah Village, Disenchantment Bay, and Port Clarence, Alaska. (*Evans.*) Scoresby Sound and Hold-with-Hope, East Greenland. (*C. Jansen.*)

62. **J. caespiticia,** Lindb.

Cape Nome, Alaska. New to America. (*Evans.*)

63. **J. amplexicaulis,** Dumort.

On earth at Hastings, Burrard Inlet, B. C., April 8th, 1889. (*Macoun.*)

64. **J. cordifolia,** Hook.

Greenland. (*J. Vahl.*) Labrador. Collected by Waghorne. (*Underwood.*) On stones in Jupiter River, Anticosti; on wet rocks in a brook, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898; on stones in Ste. Anne des Monts River, Gaspé Co., Que.; on rocks below Jones Falls, Sydenham River, Owen Sound, Ont., July 26th, 1871; on stones in a brook at Hector, Rocky Mountains; on stones in Eagle River, Griffin Lake, B.C. (*Macoun.*) On wet rocks, Mount Queest, Shuswap Lake, B. C. (*J. M. Macoun.*) Abundant in streams running into Lake Lindeman, B.C., April 9, 1898. (*Williams.*) Alaska. (*Krause.*)

65. **J. riparia,** TAYL.

On stones by a brook at Goldstream, near Victoria and on wet earth at Comox, Vancouver Island, May 3rd, 1887. (*Macoun.*)

66. **J. atrovirens,** DUMORT.

Greenland; Virgin Bay and Unalaska, Alaska. (*Evans.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

67. **J. pumila,** WITH.

On rocks along Meech's Lake, near Chelsea, Que.; on old logs, Seymour West, Northumberland Co., Ont.; on rocks in a brook, Lake Mara, Sicamous, B. C.; on wet rocks at Lytton, Fraser River, B.C., April 17th, 1889; on old logs, Rocky Mountain Cañon, Peace River, Lat. 56°; near McLeod's Lake, Lat. 55°, B. C., June 26th, 1875; on damp rocks, Goldstream, near Victoria, Vancouver Island; on old logs, Union Mines, near Comox, V. I. (*Macoun.*) On earth, Mount Queest, Gold Range, B.C., July, 1889. (*J. M. Macoun.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

68. **J. lanceolata,** LINN.

Liochlœna lanceolata, Nees; Pearson's List, No. 98.

On dead wood, Margaree, Cape Breton Island, N.S., July, 1898; Labrador. Collected by Waghorne. (*Underwood.*) On rotten logs at Belleville, Hastings Co., Ont., June 27th, 1876; on earth in woods, Albert Cañon, Selkirk Mountains, B.C.; on old logs, Sea's farm, near Victoria, Vancouver Island. (*Macoun.*)

26. ANASTROPHYLLUM, Stephani.

69. **A. Reichardtii,** (GOTTSCHE) STEPH.

Columbia Fiord, Orca, and Port Wells, Alaska. (*Evans.*)

27. LOPHOZIA, Dumort.

70. **L. incisa,** (SCHRAD.) DUMORT.

Miquelon Island, Gulf of St. Lawrence. (*De àmare.*) On earth and dead wood, Jupiter River, Anticosti; on old logs at Truro,

N.S. ; on old logs, Gaspé Coast, Que. ; on earth and rotten wood at Margaree and Louisburg, Cape Breton Island, N.S., July, 1898 ; on rocks and rotten wood Algonquin Park, Ont., June, 1900 ; on rotten wood at Ottawa, Ont. ; on logs on the borders of swamps at Belleville, Hastings Co., Ont. ; on old logs at Nipigon River, Lake Superior ; on rotten logs, Pic Island, Thunder Bay, Lake Superior ; on old logs in woods at Revelstoke, B.C. , on dead wood, House Mountain, near Lesser Slave Lake, Atha. ; on dead wood, Rocky Mountain Cañon, Peace River, Lat. 56° ; on old logs at Hector, Rocky Mountains ; on dead wood at Roger's Pass, Selkirk Mountains, B.C. ; on old logs west of Fraser River at Quesnel, B. C. ; on rotten wood at Hastings, Burrard Inlet, B.C. ; on old logs at Esquimault, near Victoria, Vancouver Island ; on rotten logs at Comox, Vancouver Island. (*Macoun.*) On Mount Queest, Shuswap Lake, B.C. ; Chilliwack Lake, B.C. (*J. M. Macoun.*) Hot Spring near Sitka, Juneau, Columbia Fiord, Orca, Kadiak Island, Hall Island and Cape Nome, Alaska. (*Evans.*) On *Sphagnum*, Klondike, Yukon, Sept. 18, 1898. (*Williams.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

71. **L. ventricosa,** (Dicks.) Dumort.

Labrador, collected by Waghorne. (*Underwood.*) On earth, Seal Lake, Labrador, August, 1896. (*A. P. Low.*) Alaska. *Krause.*) On rotten wood, Jupiter River, Anticosti ; on earth and old logs, common along the Gaspé coast and up Ste. Anne des Monts River, Gaspé Co., Que. ; quite common at Woodstock, N.B., July, 1899 ; on rotten wood and earth at Baddeck, Margaree and Louisburg, Cape Breton, N.S., July, 1898 ; quite common on old logs, Algonquin Park, Ont., June, 1900 ; on old logs, Owen Sound, Ont. ; on rocks, Humboldt Island, Lake Nipigon ; on an old log, Birch Island, Lake Huron, Aug. 26th, 1901 ; on dead wood, Red Rock, Lake Superior ; on House Mountain, near Lesser Slave Lake, Atha., Sept. 19th, 1872 ; on dead wood at Belleville, Hastings Co., Ont. ; on logs at " the gap," Crow's Nest Pass, Rocky Mountains, 1897 ; on earth at Lake Louise, near Laggan, Rocky Mountains ; on old logs, Rocky Mountain Cañon, Peace River, Lat. 56° ; on dead wood, McLeod's Lake, B.C., Lat. 55° ; on rotten wood at Revelstoke, Columbia River, B.C.; on earth and old logs, Eagle Pass, B.C., and on mountains north

of Griffin Lake, Eagle River, B.C. ; on rocks, Parson's Mountain, near Victoria, and on logs at Union Mines, Comox, Vancouver Island. (*Macoun.*) Vancouver Island. (*Lyall.*) On Mount Queest, Shuswap Lake, B.C. (*J. M. Macoun.*) Juneau, Sitka, Douglas Island, Virgin Bay, Columbia Fiord, Port Wells, Orca, Yakatut Bay, Kadiak Island and Port Clarence, Alaska. (*Evans.*) Popoff Island. (*Townsend.*) St. George Island, Behring Sea and Nagai Island, Shumagin Group, Alaska. (*J. M. Macoun.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

Var. **porphyroleuca,** NEES. (Scarcely a variety.)

On rotten wood along the Gaspé Coast and along Ste. Anne des Monts River, Gaspé Co., Que. ; on old logs at Belleville, Hastings Co., Ont. ; on rocks northeast coast of Lake Superior ; on dry rocks, Lake Nipigon and on Humboldt Island in same lake ; on rocks, Pine Portage, Dawson Route, west of Lake Superior ; on rotten logs at Donald, Columbia River, B.C. ; on rotten wood, mountains north of Griffin Lake, Gold Range, B.C.; on old logs west of the Fraser River at Quesnel, B.C. ; on dead wood at Hastings, Burrard Inlet, B.C. (*Macoun.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

Var. **longiflora,** NEES. (Scarcely a variety.)

On old logs, coast of Gaspé, Que., August 8th, 1882. (*Macoun.*)

Another variety not yet named, was collected on old logs, Salt Spring Island, Gulf of Georgia, B.C., May 9th, 1887.

72. **L. guttata,** (LINDB. & ARNELL) EVANS.

Point Gustavus, Glacier Bay, Columbia Fiord, and Kadiak Island, Alaska. (*Evans.*)

73. **L. alpestris,** (SCHLEICH.) EVANS ; Collins, Rhodora 3. 181, 1901.

At Godthaab, West Greenland. (*Warming & Holm.*) Summit of Mount Albert, Gaspé Co., Que. ; on stones in brooks, east coast of Lake Superior, July 28th, 1869 ; on rocks, mountain north of Hector, Rocky Mountains ; on rocks in Roger's Pass, Selkirk Mountains, B.C. ; on earth, Mount Mark, Vancouver Island. (*Macoun.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

74. **L. longidens,** (LINDB.)

On wet rocks, Smoky Mountain, Cape Breton Island, N.S., Aug. 3rd, 1898. Mixed with *L. ventricosa.* (*Macoun.*)

75. **L. plicata,** (HARTM.)

Along the sea shore at Upernivak, Greenland. (*Ussing.*)

76. **L. Wenzellii,** (NEES.) STEPH.

Sukkertoppen, Greenland, Aug. 1884. (*Warming & Holm.*)
Scoresby Sound, East Greenland. (*C. Jansen.*)

77. **L. obtusa,** (LINDB.) EVANS.

Juneau, Alaska. (*Evans.*)

78. **L. inflata,** (HUDS.) M. A. HOWE.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) Greenland. (*Vahl.*) Labrador. Collected by Waghorne. (*Underwood.*) On wet earth and rocks, Smoky Mountain, near Aspy Bay and Louisburg, Cape Breton Island, N.S., July, 1898; very abundant on damp earth near No. II. Station, Sable Island, N.S., Aug. 3, 1899; on boggy ground, summit of Mount Albert, Gaspé Co., Que.; on damp rocks, at the "hole in the wall," Tudor, Hastings Co., Ont., July 13th, 1865; on roots of trees in marshes, northeast coast of Lake Superior, July 27th, 1869; in bogs, Sundance Creek, Banff, Rocky Mountains; on damp rocks, Roger's Pass, Selkirk Mountains, B.C. (*Macoun.*) Kadiak Island, and St. Michael's, Alaska. (*Evans.*) (Scoresby Sound, East Greenland. (*C. Jansen.*)

79. **L. Hornschuchiana,** (NEES.)

In a bog at Lake Louise, near Laggan, Rocky Mountains, Aug. 20th, 1891. (*Macoun.*)

80. **L. capitata,** (HOOK.)

On earth and rotten wood, Roger's Pass, B.C., August 21st, 1885; on earth and rocks on mountains north of Griffin Lake, Gold Range, B C.; on rotten wood west of Fraser River at Quesnel, B.C. (*Macoun.*)

81. **L. bicrenata,** (SCHMID.) STEPH.

On earth along Lake Nipissing, at North Bay, Algoma, Ont., May 29th, 1884. (*Macoun.*)

82. **L. excisa,** (DICKS.) STEPH.

Labrador. Collected by Waghorne. (*Underwood.*) On rotten wood at Ottawa, Ont., not rare ; on rotten logs at Belleville, Hastings Co., Ont., July 16th, 1867 ; on logs at Hector, Rocky Mountains ; on old logs in woods at Revelstoke, B.C.; on rotten wood, Albert Cañon, Selkirk Mountains, B.C. ; on old logs at Quesnel, Fraser River, B.C.; on dead wood, Sea's farm, near Victoria, Vancouver Island. (*Macoun.*)

83. **L. Vahliana,** (NEES.)

Baals River, Greenland. (*J. Vahl.*)

84. **L. colpodes,** (TAYL.)

North America. [Rocky Mountains.] (*Drummond.*) On old logs west of the Fraser River, at Quesnel, B.C., June 4th, 1875. (*Macoun.*)

85. **L. groenlandica,** (NEES.)

Greenland. (*Brutel & Currie.*)

86. **L. heterocolpa,** (THED.) M. A. HOWE.

Jungermannia Wattiana, Aust. ; Pearson's List No. 110.

Jungermannia Mülleri, Nees, var. *maritima,* Pearson's List No. 119.

On moss on wet rocks above Otter Head, northeast of Lake Superior, July 29th, 1869. (*Macoun.*) Port Wells, Alaska. (*Evans.*) Over rocks and earth on mountain side, Dawson, Yukon, 1898. (*Williams.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

87. **L. Mülleri,** NEES.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) On earth along the Ste. Anne des Monts River, Gaspé Co., Que., Aug. 21st,

1882 ; on earth along the Gaspé Coast, Gaspé Co., Que. ; on a damp spot by a creek in the File Hills, near Qu'Appelle, Assa., July 6th, 1879. (*Macoun.*)

88. **L. Bantriensis,** (Hook.)

On old logs at the Rocky Mountain Cañon, Peace River, Lat. 56°, Oct. 24th, 1872 ; on wet logs at the Union Mines near Comox, Vancouver Island, July 4th, 1893. (*Macoun.*)

89. **L. barbata,** (Schreb.) Dumort.

Greenland. (*Vahl.*) Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) Labrador. Collected by Waghorne. (*Underwood.*) On rocks along Gaspé coast, Que.; on rocks in damp ravines and by brooks, Cape Breton Island, N.S., July, 1898 ; on rocks in a ravine, Woodstock, N.B., July, 1899 ; on rocks at Chelsea, near Ottawa, Ont.; on moss on rocks, Sudbury Junction, Algoma, Ont.; very common on rocks in Algonquin Park, Ont., July, 1900 ; on rocks, Lake Nipigon, and at Current River, Thunder Bay, Lake Superior ; on rocks, North Hastings, Ont.; on rocks near Devil's Lake, Banff, and at Hector, Rocky Mountains ; on rocks, Pass Creek, Sproat, Columbia River, B.C. ; Roger's Pass, Selkirk Mountains, B.C.; on earth on rocks, Victoria, Vancouver Island. (*Macoun.*) Klondike River bottom, Yukon, Oct. 9, 1898. (*Williams.*)

90. **L. attenuata,** (Mart.) Dumort.

Labrador. Collected by Waghorne. (*Underwood.*) On old logs at Baddeck and Aspy Bay, Cape Breton Island, N.S., July, 1898 ; on rocks, summit of Mount Albert, Gaspé Co., Que. ; on rocks at Pictou, N.S.; on rocks at Rockcliffe and Hull, near Ottawa, Ont.; on damp, perpendicular rocks, Otter Head, Lake Superior, July 29th, 1869 ; on rocks in Roger's Pass, Selkirk Mountains, B.C.; on old logs at Revelstoke, Columbia River, B.C.; on damp rocks, Eagle Pass, Gold Range, B.C. (*Macoun.*) Virgin Bay, and Unalaska, Alaska. (*Evans.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

91. **L. quinquedentata,** (Huds.) Cogn.

At Godthaab, West Greenland. (*Warming & Holm.*) Labrador. Collected by Waghorne. (*Underwood.*) On old logs and rocks

in a ravine, Margaree, Cape Breton Island, N.S., July, 1898; on rocks in a ravine at Woodstock, N.B., July, 1899; on earth along the Gaspé coast, Que.; on moss at Sudbury Junction, Algoma, Ont.; on rocks near Otter Head, Lake Superior; common on rocks on islands in Lake Nipigon; on old logs, Duck Bay, Lake Winnipegosis, Man.; on old logs and rocks, Dawson Route, west of Lake Superior; on earth, Lake Louise, near Laggan, and at Hector, Rocky Mountains. (*Macoun.*) St. Matthew Island, Alaska. (*Evans.*) On rocks, Klondike, Yukon, Oct. 10th, 1898. (*Williams.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

92. **L. Flœrkii,** (Web. & Mohr) Schiffn.

On rocks at Whale River, Labrador, July 26th, 1896. (*A.P.Low.*) On rocks and earth at Morley and Hector, Rocky Mountains, June 14th and July 29th, 1885; on rocks, Roger's Pass, Selkirk Mountains, B.C.; on rocks at Yale, Fraser River, B.C., May 17th, 1875; on rocks at Nanaimo, on Mount Benson, Mount Mark and Mount Arrowsmith, Vancouver Island. (*Macoun.*) Chilliwack Lake, B.C. (*J. M. Macoun.*) Unalaska, Orca, and Port Wells, Alaska. (*Evans.*) On wet rocks, Lake Lindeman, B.C., May 22nd, 1898. (*Williams.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

Var. **alpina,** Pearson. (Scarcely distinct.)

On earth on the mountain north of Kicking Horse Lake, Rocky Mountains, B.C. alt. 7,000 feet, July 20th, 1885; on rocks, Moose Mountain, Elbow River, Rocky Mountains, 1897. (*Macoun.*)

Another variety has been reported from Greenland by Currie.

93. **L. lycopodioides,** (Wallr.) Cogn.

West Greenland. (*Warming & Holm.*) Fort Chimo and Seal Lake, Labrador, Aug., 1896. (*A. P. Low.*) Labrador. Collected by Waghorne. (*Underwood.*) On rocks, Stupart's Bay, Hudson Strait. (*Dr. R. Bell.*) On rocks at Pirate's Cove, N.S.; on rocks at Campbellton, N.B.; on rocks near Ottawa, Ont.; on rocks, Lake Winnipegosis, Man.; on moss in woods, Hector and Lake Louise, Rocky Mountains; on rocks, McLeod's Lake, B.C.; on stones in Roger's Pass, Selkirk Mountains, B.C.; mountains north of Griffin Lake, Eagle Pass, B.C.; on earth along the Columbia

River at Revelstoke, B.C. (*Macoun.*) Mountains east of Adam's Lake, B.C., alt. 6,300 feet ; on rocks, Tulameen Mountains, B.C. (*Dr. G. M. Dawson.*) Very common among bushes, Lake Lindeman, B.C., May 22nd, 1898. (*Williams.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

94. **L. quadriloba,** (LINDB.) EVANS.

Hooniah Village, Alaska. (*Evans.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

95. **L. Kunzeana,** (HÜBEN.)

On rocks on Humboldt Island, Lake Nipigon, Ont. ; also in a peat bog by Nipigon River ; on rocks at Sudbury Junction, Algoma, Ont. ; on rotten wood at Quesnel, Fraser River, B.C. ; in bogs between Dunvegan and St. John, Peace River, Athabaska, Oct. 10th, 1872. (*Macoun.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

96. **L. polita,** (NEES). Possibly a form of preceding.

On earth, along the coast, Gaspé Basin, Gaspé Co., Que., July 21st, 1882 ; on earth at the Asulcan Glacier, Selkirk Mountains, B.C. (*Macoun.*)

97 **L. Michauxii,** (WEB.)

On earth on rocks, Seal Lake, Labrador, July 29th, 1896. (*A. P. Low.*) On rocks, North West Arm, Halifax, N.S.; on logs, Ste. Anne des Monts River, Gaspé Co., Que.; on rotten wood at Belleville, Hastings Co., Ont., July 20th, 1868 ; on rocks, Lake Nipigon, Ont. ; on rocks and rotten wood, Algonquin Park, Ont., June, 1900 ; on rocks, Dawson Route, west of Lake Superior ; on old logs, Revelstoke, Columbia River, B.C. (*Macoun.*)

98. **L. saxicola,** (SCHRAD.) SCHIFFN.

Greenland. (*Vahl.*) On earth in bogs, summit of Mount Albert, Gaspé Co., Que., 26th August, 1882. (*Macoun.*) Alaska. (*Krause.*) On rocks, Klondike, Yukon, Oct. 10th, 1898. (*Williams.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

99. **L. exsecta,** (SCHMID.) DUMORT.

On rocks at South West Point, Anticosti ; on dead wood, Hemlock Lake, Ottawa, October, 1900; on an old log, Algonquin Park, Ont., July 17th, 1900 ; on dead wood, Jumping Pound Creek, Alta., June, 1897 ; on rocks and earth at Morley, Rocky Mountains ; on dead wood west of Fraser River at Quesnel, B.C. (*Macoun.*) North America. (*Drummond.*)

Var. **scituta,** (TAYLOR) PEARSON. (Scarcely distinct.)

New Brunswick. (*Herb. Austin.*) On earth and logs, coast of Gaspé, Que. ; common on dead wood at Ottawa, Ont. ; on rotten wood at Belleville, Hastings Co., Ont. ; on earth and moss, north side of Pic Island, Thunder Bay, Lake Superior ; on old logs, Dog Island, Lake Nipigon ; on old stumps and logs at Revelstoke, B.C. (*Macoun.*)

100. **L. Helleriana,** (NEES.)

On old logs at Belleville, Hastings Co., Ont.; in woods near Experimental Farm, Ottawa, Ont., April 16th, 1892 ; on old logs at the mouth of Nipigon River, Lake Superior, July 12th, 1869 ; on burnt logs west of the Fraser River, Quesnel, B.C., June 4th, 1875 ; on earth at Pass Creek Falls, near Sproat, Columbia River, B.C. (*Macoun.*)

101. **L. minuta,** (CRANTZ) SCHIFFN.

Labrador. Collected by Waghorne. (*Underwood.*) Holstensborg, Greenland. (*Warming & Holm.*) Nottingham Island, Hudson Strait. (*Dr. R. Bell.*) On wet rocks, Smoky Mountain, Cape Breton Island, N.S., Aug., 1898 ; on rocks Câche Lake, Algonquin Park, Ont., July, 1900 ; on granite rocks, above Otter Head, Lake Superior, July 29th, 1869 ; on rocks, Sudbury Junction, Algoma, Ont. ; on rocks, Lake Nipigon, Ont, ; on rocks at Hector, Kicking Horse Lake, Rocky Mountains, B.C. ; on rocks, Roger's Pass, Selkirk Mountains, B.C. (*Macoun.*) Chilcoot, Alaska. (*Krause.*) Columbia Fiord, Orca, Hall Island, St. Lawrence Island, Sitka and Popoff Island, Alaska. (*Evans.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

102. **L. ovata,** (Dicks.) M. A. Howe.

Yakutat Bay, Alaska ; in very small quantity. (*Evans.*)

28. PLAGIOCHILA, Dumort.

103. **P. interruptus,** (Nees) Dumort.

Greenland. (*Vahl.*) Labrador. Collected by Waghorne. (*Underwood.*) On earth in Dow's Swamp, near Ottawa, Ont.; in water in bogs at Albert Cañon, Selkirk Mountains, B.C.; on wet logs at Quesnel, Fraser River, B.C., June 4th, 1875. (*Macoun.*)

104. **P. asplenioides,** (Linn.) Dumort.

P. porelloides, (Torrey) Pearson's List No. 91.

On earth, Canaan Forks, Queen's Co., N.B. (*Moser.*) On damp earth and rocks by brooks, Margaree and Half-Way Brook, Cape Breton Island, N.S., July, 1898 ; on logs at Truro and Yarmouth, N.S., June, 1883 ; on earth, Cove Head, Prince Edward Island, July, 1888 ; on earth, Gaspé coast and on gravel along Ste. Anne des Monts River, Gaspé Co., Que., August, 1882 ; on the margins of brooks at Ottawa and at Meech's Lake, near Chelsea, Que., Sept., 24th, 1893 ; on earth by brooks at Belleville, Hastings Co., Ont. ; on rocks at Owen Sound, Ont.; on rocks in woods, Algonquin Park, Ont., June, 1900 ; amongst moss and on rocks, Dog Island, Lake Nipigon, Ont.; on clay banks, Queenston Heights, Ont., 1901 ; on earth, Sudbury Junction, Algoma, Ont.; on damp rocks, Current River, Thunder Bay, Lake Superior ; on wet rocks at Banff and Hector, Rocky Mountains ; on wet earth, House Mountain, near Lesser Slave Lake, Athabasca, Sept. 20th, 1872 ; on wet logs, McLeod's Lake, British Columbia, Lat. 55° ; on rocks at Donald, B.C.; on wet earth at Revelstoke, Pass Creek and Robson, Columbia River, B.C.; on wet earth at Agassiz and Burrard Inlet, B.C., 1889 ; on rocks near Victoria, on Mount Arrowsmith and Mount Mark, and at Union Mines, Comox, Vancouver Island. (*Macoun.*) Farragut Bay, Sitka, Yakatut Bay and Unalaska, Alaska. (*Evans.*)

29. MYLIA, S. F. Gray.

105. **M. Taylori,** (Hook.) S. F. Gray.

Greenland. (*Vahl.*) Labrador. Collected by Waghorne. *Underwood.*) Newfoundland. (*Pearson.*) Miquelon Island, Gulf of

St. Lawrence. (*Delàmare.*) On earth and wet rocks, Pirate's Cove, Canso, N.S.; on logs at Margaree and rocks at Half-Way House, and Louisburg, Cape Breton Island, N.S., July, 1898; on logs subject to inundation, Ste. Anne des Monts River, and on logs in swamps, Mount Albert, Gaspé Co., Que.; in a bog at House Mountain, Lesser Slave Lake, Atha., Sept. 20th, 1872; on old logs in Stanley Park, Vancouver, B.C. (*Macoun.*) Hot Spring, Juneau, Douglas Island, Virgin Bay, Farragut Bay, Orca, Columbia Fiord, Port Wells and Sitka, Alaska. (*Evans.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

106. **M. anomala,** (HOOK.) S. F. GRAY.

In a peat bog at Salt Lake, Anticosti; in a peat bog between Dunvegan and St. John, Peace River, Atha., Lat. 56°, Oct. 16th, 1872; on earth along a brook at Lytton, B.C. (*Macoun.*) On *Sphagnum* at Dawson, Yukon, Aug. 31st, 1898. (*Williams.*)

30. LOPHOCOLEA, Dumort.

107. **L. bidentata,** (LINN.) DUMORT.

On rotten logs, Eastman's Springs, 12 miles from Ottawa, Ont.; on old logs vicinity of Victoria, Vancouver Island, May 6th, 1875; on dead wood at Comox, Vancouver Island, April 29th, 1887. (*Macoun.*)

108. **L. minor,** NEES.

On cliffs, Canaan Forks, Queen's Co., N. B. (*Moser.*) On limestone rocks and dead wood in the vicinity of Ottawa, Ont.; on rocks, Carleton Place, Carleton Co., Ont.; among moss on limestone rocks along the Moira at Belleville, Hastings Co., Ont., June 20th, 1867; on limestone rocks, Owen Sound, Ont.; on rocks at Otter Head and Pie Island, Lake Superior; on earth in woods at Revelstoke, Columbia River, B.C.; on earth at Quesnel, Fraser River, B.C.; on rocks, House Mountain, Lesser Slave Lake, Atha. (*Macoun.*)

109. **L. Macounii,** AUST.

On rotten wood along the Gaspé Coast, Gaspé Co., Que.; on rotten wood at Ottawa, Ont.; on rotten logs near Belleville,

Hastings Co., Ont., June 19th, 1866 ; on old logs along Nipigon River, Ont. (*Macoun.*)

110. **L. cuspidata,** (NEES) LIMPR.

On rocks at Hector, Rocky Mountains, B.C., Aug. 14th, 1890 ; on rotten wood, Cedar Hill and Sea's farm, near Victoria, Vancouver Island ; also on *Rubus spectabilis* at Comox, V.I. (*Macoun.*) Cape Fox, Alaska. (*Evans.*)

111. **L. heterophylla,** (SCHRAD.) DUMORT.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) On rotten wood, Brackley Point, Prince Edward Island ; on earth in woods at Baddeck, Cape Breton Island, N.S., July, 1898 ; on logs, Woodstock, N.B., July, 1899 ; on roots of trees, Ste. Anne des Monts River, Gaspé Co., Que.; on rotten wood quite common at Ottawa, Ont.; on old logs at Belleville, Hastings Co., Ont. ; on rotten wood, Seymour West, Northumberland Co., Ont.; common on rocks and old logs, Algonquin Park, Ont., June, 1900 ; on old roads, High Park, Toronto, and at Leamington, Ont., 1901 ; on rotten logs, Hector, Rocky Mountains, B.C. (*Macoun.*)

31. CHILOSCYPHUS, Corda.

112. **C. adscendens,** HOOK. & WILSON.

On rotten logs in swamps five miles west of Belleville, Hastings Co., Ont., Sept. 16th, 1867 ; on old logs at Owen Sound, Ont.; on old logs at Thunder Bay, Lake Superior ; on rotten wood west of Fraser River at Quesnel, B.C. ; on rotten logs at Revelstoke, and in Eagle Pass, west of Revelstoke, Columbia River, B.C.; on earth at Hastings, Burrard Inlet, B.C.; on old logs at Comox, Vancouver Island. (*Macoun.*) Kootenay Pass, Rocky Mountains, 1883. (*Dr. G. M. Dawson.*) No doubt some specimens referred here belong to the next species.

113. **C. polyanthos,** (LINN.) CORDA.

Labrador. Collected by Waghorne. (*Underwood.*) Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) On old logs at Truro, N.S.; on stones in brooks at Margaree and Half-Way House, Cape Breton Island, N.S., July, 1898 ; on wet sand, Sable

Island, N.S., July, 1899; on stones, Otter Slide Brook, Algonquin Park, Ont., July, 1900; on earth amongst moss at Belleville, Hastings Co., Ont., May 20th, 1866; on old logs in wet woods, Jordan Station, Ont., 1901; on earth in a peat bog near New Westminster, B.C.; also on damp logs and earth at Hastings, Burrard Inlet, B.C.; on dead wood in a swamp at Comox, Vancouver Island. (*Macoun.*) Juneau, Port Gustavus, Glacier Bay, Yakatut Bay and Unalaska, Alaska. (*Evans.*)

VAR. **rivularis,** NEES.

On stones in brooks, Canaan Forks, Queen's Co., N.B. (*Moser.*) On rocks, Little Tobique River, N.B. (*Hay.*) On stones in a brook, Brackley Point, Prince Edward Island; on stones in Jupiter River, Anticosti; on stones in Fox River, Gaspé Co., Que., Aug. 2nd, 1882; on stones in a brook, Woodstock, N.B.; July, 1899; in the bed of a brook, Kootenay Lake, B.C.; on stones in a brook at Hastings, Burrard Inlet, B.C.; on logs in Colquitz River, B.C.; on sticks in Sea's swamp, near Victoria, Vancouver Island; on stones in Mill Stream, Nanaimo, V. I.; on sticks in the river at Comox, V.I. (*Macoun.*) Rocks beside rivulets, Cheam Range, north of Chilliwack River, B.C.; Attu Island, Behring Sea. (*J. M. Macoun.*) Salmon Creek, near Juneau, Alaska. (*Miss G. Cooley.*)

32. HARPANTHUS, Nees.

114. **H. scutatus,** (WEB. & MOHR) SPRUCE.

Labrador. Collected by Waghorne. (*Underwood.*) Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) On earth on rocks at Margaree, Cape Breton Island, N.S., July, 1898; on old logs at Woodstock, N.B., July, 1899; on old logs, Pirate's Cove, Canso, N.S.; on rotten logs at Ottawa, Ont.; on old logs and rotten wood at Belleville, Hastings Co., Ont., May 24th, 1865; on rotten wood, Sudbury Junction, Algoma, Ont.; on rotten wood along Lake Superior and at the mouth of the Nipigon River; on earth and mosses at Hector, Rocky Mountains, July 21st, 1885. *Macoun.*)

115. **H. Flotowianus,** NEES.

Greenland. (*Pearson.*) Labrador. Collected by Waghorne. (*Underwood.*) Rocky Mountains. (*Bourgeau.*) Mountains of the

Gold Range, north of Griffin Lake, B.C., alt. 7,500 ft., Aug. 4th, 1889. (*Macoun.*) Hot Springs, Orca, Port Wells and Yakatut Bay, Alaska. (*Evans.*)

33. GEOCALYX, Nees.

116. **G. graveolens,** (SCHRAD.) NEES.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) On earth in woods, Margaree, Cape Breton Island, N.S., July, 1898 ; on old logs, Jupiter River, Anticosti ; on dead wood and earth, Pirate's Cove, Canso, N.S. ; on earth at Truro, N.S.; on earth along the Gaspé coast, Gaspé, Co., Que.; on earth and dead wood at Ottawa, Ont., and Hull, Que.; on earth and rotten wood at Belleville, Hastings Co., Ont.; old logs, Seymour west, Northumberland Co., Ont.; on old logs in woods, Jordan Station, Ont., 1901 ; on old logs, Red Rock, Nipigon, Lake Superior ; on rotten logs at Hector, Rocky Mountains, B.C. ; on rotten wood at Quesnel, Fraser River, B.C., 1875 ; on rotten wood at Goldstream, near Victoria, Vancouver Island ; on earth at Comox, Vancouver Island. (*Macoun.*) Dawson, Yukon, Aug. 31st, 1898. (*Williams.*)

34. CEPHALOZIA, Dumort.

117. **C. curvifolia,** (DICKS.) DUMORT.

On rotten logs, quite common in the east.

On rotten logs, Fredericton, N.B. (*Prof. Fowler.*) Along Jupiter River, Anticosti ; by Otter Pond, near Brackley Point, Prince Edward Island ; Pirate's Cove, Canso, N.S.; abundant on dead wood at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898; Mount Albert and along Ste. Anne des Monts River, Gaspé Co., Que.; in woods at Ottawa, Ont.; common at Belleville, Hastings Co., Ont., July 20th, 1867 ; on Pelee Island, Lake Erie and at Owen Sound, Ont. ; quite common on old logs in Algonquin Park, Ont., June, 1900. (*Macoun.*)

118. **C. media,** LINDB.

C. multiflora, Spruce ; Pearson's List, Can. Hep. p. 9.

On rotten wood, very common from the Atlantic to the Pacific.

Labrador. Collected by Waghorne. (*Underwood.*) Miquelon Island, Gulf St. Lawrence. (*Delàmare.*) South West Point and St. Mary's River, Anticosti ; on rotten wood and peat, Cape

Breton Island, N.S., July, 1898; Pirate's Cove, Canso, N.S.; surface of a bog and on dead wood, Otter Pond, Prince Edward Island; very common on dead wood around Ottawa, Ont.; common at Belleville, Hastings Co., Ont., June 16th, 1865; North Bay, Lake Nipissing, Algoma; very common on old logs, Algonquin Park, Ont., June, 1900; on shaded, moist, perpendicular rocks, Otter Head, Lake Superior; on earth in a swamp, Nipigon River and on rotten wood, Thunder Bay, Lake Superior; on old logs, Hector, Rocky Mountains; on earth and old logs, Lake Louise, and on rotten wood at Lake Agnes, Laggan, Rocky Mountains; on old logs and stumps at Revelstoke, Columbia River, B.C.; on earth in the Eagle Pass, B.C.; on earth, at Sicamous, B.C.; on rotten wood at Quesnel, Fraser River, B.C.; on rotten wood at Hastings, Burrard Inlet, B.C.; on old logs on Cedar Hill, Goldstream and Parson's Mountain, near Victoria and on rotten wood at Comox, Vancouver Island. (*Macoun.*) On old logs, Chilliwack Lake, B.C. (*J. M. Macoun.*) Douglas Island, Orca, Columbia Fiord, Farragut Bay and Yakutat Bay Alaska. (*Evans.*) Salmon Creek, near Juneau, Alaska. (*Miss G. Cooley.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

119. **C. catenulata,** (Hüben) Lindb.

On rotten wood, Otter Pond, Prince Edward Island; on old logs, Baddeck, Cape Breton Island, N.S., July 8th, 1898; on rotten wood at Truro, N.S.; on old logs along the Gaspé coast and along the Ste. Anne des Monts River, Gaspé Co., Que.; on old logs at Ottawa, Ont., on burnt logs, Sudbury Junction, Algoma; on rotten wood at Belleville, Hastings Co., Ont., 1867; not rare on old logs in Algonquin Park, Ont., June, 1900; shores of Lake Superior, 1869; on old logs, Peace River, Lat. 56°; on rotten logs, Quesnel, Fraser River, B.C., 1872 and 1875; on rotten wood, Salt Spring Island Gulf of Georgia, B.C.; on rotten wood, Cedar Hill and Goldstream, near Victoria and at Comox, Vancouver Island. (*Macoun.*)

120. **C. bicuspidata,** (Linn.) Dumort.

C. Lammersiana, Pearson's List, No. 39.

C. extensa, Pearson's List, No. 40.

Greenland. (*Vahl.*) Labrador. Collected by Waghorne. (*Underwood.*) Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*)

On earth at Rustico, Brackley Point and Black River, Prince Edward Island ; on earth at Jupiter River, Anticosti ; on rotten wood, earth and rocks, Cape Breton Island, N.S., July, 1898 ; on earth, Pirate's Cove, N.S., July, 1883 ; on rotten wood at Ottawa, Ont. ; on rotten logs in a swamp near railway station, Belleville, Ont., May 16th, 1869 ; on earth, White Trout Lake, Algonquin Park, Ont., July 18th, 1900 ; on earth, North Bay, Lake Nipissing, Algoma ; on rotten wood, Roger's Pass, Selkirk Mountains, B.C., Aug. 24th, 1885 ; on earth, Eagle Pass, B.C., 1889 ; mountains north of Griffin Lake, B.C., 1889 ; quite common on old logs at Hastings, B.C., April, 1889 ; Mount Finlayson, near Victoria ; on old logs at Shawnigan Lake, at Sea's farm, Victoria, and very common at Goldstream, Vancouver Island ; on dead wood at Comox, Vancouver Island. (*Macoun.*) Mount Queest, Shuswap Lake, B.C. (*J. M. Macoun.*) Sitka, Mt. Verstovia, Juneau, Hidden Glacier Inlet, Orca, Columbia Fiord, Farrugut Bay, Yakutat Bay, Kadiak Island and Attu Island, Alaska. (*Evans.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

121. **C. pleniceps,** (Aust.) Lindb.

On rotten wood and on stones in woods at Ottawa, Ont.; on moss near the snow line (alt. 7,500 feet) at Hector, Rocky Mountains ; on rotten wood at Cedar Hill, Victoria, and on old logs at Nanaimo, Vancouver Island. (*Macoun.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

122. **C. fluitans,** (Nees) Spruce.

Labrador. Collected by Waghorne (*Underwood.*) Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) Floating in water in a *Sphagnum* swamp, Salt Lake, Anticosti, Aug. 10th, 1883 ; in a peat bog at Brulé Lake, Algonquin Park, Ont., June 13th, 1900 ; in a peat bog near New Westminister Junction, B.C. (*Macoun.*

123. **C. divaricata,** (Smith) Dumort.

In wet places, Greenland. (*Dr. Rosenvinge.*) Labrador. Collected by Waghorne. (*Underwood.*) On damp rocks at Yar-

mouth, N.S., June 24th, 1882 ; on damp rocks, Sudbury Junction, Algoma ; on damp rocks, Otter Head, Lake Superior, July 28th, 1869 ; on rocks, Nipigon River, Ont. ; on wet rocks, House Mountain, Lesser Slave Lake, Atha. ; on rocks, Parson's Mountain, Cedar Hill, and Sea's farm, near Victoria, Vancouver Island ; at Comox, V.I. (*Macoun.*) On stones, Mount Queest, Shuswap Lake, B.C. (*J. M. Macoun.*) Cascade Mountains, British Columbia. (*Lyall.*) Unalaska, Alaska. (*Evans.*) Scoresby Sound and Hold-with-Hope, East Greenland. (*C. Jansen.*)

124. **C. Macounii,** Aust.

On rotting logs of *Ulmus Americana*, in Barlow's swamp, Belleville, Hastings Co., Ont., May 20th, 1865 ; on dead wood, Michipicoten Island, Lake Superior ; on old logs, Roger's Pass, Selkirk Mountains, B.C.; at Revelstoke, Columbia River, B.C. (*Macoun.*)

125. **C. Sullivantii,** Aust.

On old elm logs in swamps east of Belleville, Hastings Co., Ont., May 11th, 1866. (*Macoun.*)

126. **C. minima,** Aust.

Growing on rotten wood and old logs in swamps at Belleville, Hastings Co., Ont., May, 1868. (*Macoun.*)

127. **C. dentata,** (Raddi) Lindb.

Galton Mountains, British Columbia. (*Lyall.*)

128. **C. leucantha,** Spruce.

Columbia Fiord, Alaska. (*Evans.*)

35. HYGROBIELLA, Spruce.

129. **H. laxifolia,** (Hook.) Spruce.

Near Lichenfels, Greenland. (*Vahl.*) Labrador, "Camp 3," Aug. 21st, 1896. Collected by Prof. Atkinson. (*Evans.*)

36. ODONTOSCHISMA, Dumort.

130. **O. sphagni,** (Dicks.) Dumort.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) On the surface of a bog at Louisburg, Cape Breton Island, August, 1898; on old pine logs at Belleville, Hastings Co., Ont., May 10th, 1866. (*Macoun.*) In a swamp at Dawson, Yukon, Sept. 8th, 1898. (*Williams.*)

131. **O. denudatum,** (Nees) Dumort.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) On rotten logs, Baddeck, Cape Breton Island, N.S., July, 1898; at Pirate's Cove, N.S., 1883; on pine stumps at Belleville, Hastings Co., Ont., June 16th, 1866; on a pine log in Beechwood, Ottawa, Ont. (*Macoun.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

132. **O. Macounii,** Aust.

Cephalozia Austini, Pearson's List Can. Hep. p. 10.

On earth and amongst the roots of *Scripus cæspitosus* 25 miles north of Michipicoten and near Otter Head, Lake Superior, July 28th, 1869. (*Macoun.*)

37. KANTIA, S. F. Gray.

133. **K. Trichomanis,** (Linn.) S. F. Gray.

Labrador. Collected by Waghorne. (*Underwood.*) Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) Along the Tobique River, N.B. (*G. U. Hay.*) On old logs, Canaan Forks, Queen's Co., N.B. (*Moser.*) On rotten wood at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898; on rotten wood along Jupiter River, Anticosti; on earth and old logs, Gaspé Basin, Gaspé Co., Que.; on dead wood at Ottawa, Ont., and at the Cascades, Gatineau River, Que.; at Carleton Place, Carleton Co., Ont.; on old logs, Lake Nipissing, Algoma; on old logs and stumps at Belleville, Hastings Co., Ont., June 16th, 1865; on earth, Lake Louise, near Laggan, Rocky Mountains; on earth and rotten wood at Revelstoke, Columbia River, B.C.; on old logs at Hastings, Burrard Inlet, B.C.; on logs at Comox and Victoria, Vancouver

Island. (*Macoun.*) On logs, Port Etches, Lat. 60°, Alaska. (*J. M. Macoun.*) Douglas Island, Orca, Columbia Fiord, Farragut Bay, Sitka, and Yakutat Bay, Alaska. (*Evans.*)

38. BAZZANIA, S. F. Gray.

134. **B. trilobata,** (Linn.) S. F. Gray.

Newfoundland. (*Hb. Le Jolis.*) On mossy logs, Hamilton farm, River Rouge, Argenteuil Co., Que. (*D'Urban.*) On old logs, North West Arm, Halifax, and on rocks at Truro, N.S. ; on old logs and stumps, Baddeck and Margaree, Cape Breton Island, July, 1898; on rocks, Jupiter River, Anticosti ; on stumps, Brackley Point, Prince Edward Island ; on old logs, Gaspé Co., Que.; on old logs at Ottawa, Ont.; on logs and stumps in swamps at Belleville, Hastings Co., Ont. ; in swamps at Owen Sound, Ont. ; on old logs, North Bay, Lake Nipissing, Algoma ; on old logs, Lake Nipigon, Ont. ; quite common on old stumps in Algonquin Park, Ont., July, 1900. (*Macoun.*) Along the Tobique River, N.B. (*Hay.*)

135. **B. triangularis,** (Schleich.) Lindb.

On damp rocks, Louisburg, Cape Breton Island, August, 1898 ; on rocks, Pirate's Cove, Canso, N.S., July 7th, 1883 ; on rocks in wet woods, Roger's Pass, Selkirk Mountains, B.C. ; on old logs at Revelstoke, Columbia River, B.C. ; on earth in a bog at New Westminster, B.C. ; on earth and rotten wood at Hastings, Burrard Inlet, B.C. ; on rotten wood at Union Mines and Comox, Vancouver Island. (*Macoun*) Chilliwack, Lake, B.C., 1901. (*J. M. Macoun.*) On Bartledown Island, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*) Chilcat, Alaska. (*Krause.*) Hot Spring, Wrangel, Juneau, Port Wells, Farragut Bay, Loring, and Sitka, Alaska. (*Evans.*)

136. **B. denudata,** (Torrey) S. F. Gray.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) This species has been referrd to *Bazzania deflexa* Nees, by Austin. (*Pearson.*) My specimens from Nova Scotia referred to *B. triangularis* may be this species, or this may be a form of *B. triangularis.* (*Macoun.*)

39. PLEUROCLADA.

137. **P. albescens,** (HOOK.) Spruce.

Greenland. (*Vahl.*) Kobbefjord, near Goethaab, Greenland, 1884. (*Warming & Holm.*) On earth on the Gold Range, north of Griffin Lake, B.C., alt. 7,500 feet, Aug. 7th, 1889. (*Macoun.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

138. **P. Islandica,** (NEES)

Northern Greenland, Lat. 64°, May 24th, 1888. (*Dr. Rosenvinge.*)

40. LEPIDOZIA, Dumort.

139. **L. reptans,** (LINN.) DUMORT.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) On rotten wood, Brackley Point, Prince Edward Island ; on rotten wood, Jupiter River, Anticosti ; on old logs, Truro, N.S. ; on earth at Baddeck, Cape Breton Island, N.S., July 9th, 1898 ; on old logs Ste. Anne des Monts River, Gaspé Co., Que. ; on old logs at Ottawa, Ont. ; on old stumps and logs, Câche Lake Algonquin Park, Ont., June 7th, 1900 ; on old logs, North Bay, Lake Nipissing, Algoma ; on rocks, Humboldt Island, Lake Nipigon ; on old logs, Manitoba House, Lake Manitoba, Man. ; on old logs, House Mountain, Lesser Slave Lake, Athabasca ; on logs at Hector and Jumping Pound Creek, Rocky Mountains ; on old logs at Revelstoke, Columbia River, B.C. ; on rotten wood at Hastings, Burrard Inlet, B.C. ; on old logs near Victoria and at Comox, Vancouver Island. (*Macoun.*) On dead wood, Alert Bay, Vancouver Island. (*Dr. G. M. Dawson.*) Chilliwack Lake, B.C. (*J. M. Macoun.*) Sitka, Douglas Island, Orca, and Yakutat Bay, Alaska. (*Evans.*)

140. **L. filamentosa,** (LEHM. & LINDB.) LINDB.

On old logs, Prince of Wales Island, Alaska, Sept. 29th, 1891. (*J. M. Macoun.*) Sumdum, Alaska, 1895. (*Miss Jessie Trowbridge.*) Douglas Island, Columbia Fiord and Farragut Bay, Alaska. (*Evans.*)

141. **L. setacea,** (Web.) Mitt.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) Orca, and Columbia Fiord, Alaska. (*Evans.*)

41. BLEPHAROSTOMA, Dumort.

142. **B. trichophyllum,** (Linn.) Dumort.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) Labrador. Collected by Waghorne. (*Underwood.*) On old logs, Jupiter River, Anticosti ; on earth, Pirate's Cove, Canso, N.S.; wet earth, Aspy Bay, Cape Breton Island, N.S., Aug., 1898 ; at the base of trees at Yarmouth, N.S.; on old logs along the Gaspé coast, and on Mount Albert, Gaspé Co., Que., alt. 4,000 feet ; on earth and logs, Ste. Anne des Monts River and Mont Louis, Gaspé Co., Que.; on earth and rotten wood, Brackley Point, Prince Edward Island ; on rotten wood, stones and earth at Ottawa, Ont.; on earth, Sudbury Junction, Algoma ; on rocks, earth and logs in Algonquin Park, Ont., July, 1900 ; on rotten wood at Belleville, Hastings Co., Ont.; on the face of moist rocks in woods, Otter Head, Lake Superior, July 28th, 1869 ; on old logs, Nipigon River, and on Humboldt Island, Lake Nipigon ; on old logs, Manitoba House, Lake Manitoba, Man.; on House Mountain, near Lesser Slave Lake, Atha.; on earth and dead wood at Hector, and Elbow River, Rocky Mountains ; on logs, Roger's Pass, Selkirk Mountains, B.C.; on rotten wood at Revelstoke, Columbia River, B.C.; on rotten wood at Quesnel, Fraser River, B.C.; on dead wood, Hastings, Burrard Inlet, B.C. (*Macoun.*) On Mount Queest, Shuswap Lake, B.C., alt. 6,000 feet. (*J. M. Macoun.*) Juneau, Orca, Yakutat Bay, Hall Island and Unalaska, Alaska. (*Evans.*) On river bank below Bonanza Creek, Yukon, June 18th, 1899. (*Williams.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

143. **B. setiformis,** (Ehrh.) Lindb.

Chandonanthus setiformis, (Ehrh.) Mitt.; Pearson List, Can. Hep. p. 13.

Greenland. (*Vahl.*) On the earth in a swamp, summit of Mount Albert, Gaspé Co., Que., alt. 4,000 feet, Aug. 26th, 1882. (*Macoun.*

Observatory Inlet, N.W. coast of America. (*Dr. Scouler.*) Alaska. (*Krause.*) On rocks, Lake Lindeman, Yukon, May 5th, 1898 (*Williams.*) On St. Matthew Island, Alaska. (*Evans.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

42. ANTHELIA, Dumort.

144. **A. julacea,** (Linn.) Dumort.

Greenland. (*Vahl.*) On wet rocks, Asulcan Glacier, Selkirk Mountains, B.C., Aug. 7th, 1890. (*Macoun.*) Virgin Bay, St. Matthew Island, St. Lawrence Island, Hall Island and Unalaska, Alaska. (*Evans.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

145. **A. juratzkana,** (Limpr.) Trevis.

St. Matthew Island and Hall Island, Alaska. (*Evans.*) Hold-with-Hope and Scoresby Sound, East Greenland. (*C. Jansen.*)

43. HERBERTA, S. F. Gray.

146. **H. adunca,** (Dicks.) S. F. Gray.

St. Paul Island, Behring Sea, Alaska. (*Dr. Merriam.*) Yes Bay and Hall Island, Alaska. (*Evans.*)

44. PTILIDIUM, Nees.

147. **P. ciliare,** (Linn.) Nees.

Alaska. (*Krause.*) Miquelon Island, Gulf of St. Lawrence. (*Delamare.*) Greenland, Lat. 60° 30′. (*Dr. Rosenvinge.*) Barren Grounds, Lat. 62° 30′, Long. 102° 45′. (*J. W. Tyrrell.*) Fort Chimo and Clearwater Lake, Labrador, July, 1896. (*A. P. Low.*) On Digge's and Nottingham islands, Hudson Strait. (*Dr. R. Bell.*) On old logs, Tobique River, N.B., July, 1884. (*G. U. Hay.*) Peat bog, Salt Lake, Anticosti; at Margaree and Baddeck, Cape Breton Island, 1898; on rotten wood, Brackley Point, Prince Edward Island; on earth, Gaspé Co., Que., Aug. 10th, 1882; on old logs at Ottawa, Ont.; on rotten wood, Belleville. Hastings Co., Ont.; on dead wood, North Bay, Lake Nipissing, Algoma; on perpendicular rocks, Lake Nipigon; on old logs, Algonquin

Park, Ont., July, 1900; on old logs at Manitoba House, Lake Manitoba, Man.; on rocks, Kicking Horse Lake and Elbow River, Rocky Mountains; on old logs at Revelstoke, Columbia River, B.C.; also at Sicamous, Shuswap Lake, B.C. (*Macoun.*) On logs Chilliwack Lake, B.C.; Kadiak Island, Alaska. (*J. M. Macoun.*) Juneau, Virgin Bay, Port Wells, Kadiak Island, St. Matthew Island, Port Clarence, Unalaska and St. Michael's Alaska. (*Evans.*) On ground in woods, Dawson, Yukon, Sept. 7th, 1898. (*Williams.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

148. **P. pulcherrimum,** (Web.) Hampe.

On logs, Gaspé Co., Que., Aug. 10th, 1882. (*Macoun.*) Scarcely distinct from *P. ciliare.*

149. **P. Californicum,** (Aust.) Pearson, List Can. Hep. p. 7.

On branches, twigs and trunks, in Eagle Pass, B.C.; on rocks, Hector, Rocky Mountains, B.C.; on logs in woods at Hastings, Burrard Inlet, B.C.; on the base of trees and on rotten logs, Sea's farm, Victoria, 1875; on rocks, Mount Benson, Nanaimo, and on old logs, Union Mines, near Comox, Vancouver Island. (*Macoun.*) On old logs, Carmanah Bay, Vancouver Island; Prince of Wales Island, Alaska, Oct. 1st, 1891. (*J. M. Macoun.*) Sitka, Virgin Bay, Port Wells, Orca and Columbia Fiord, Alaska. (*Evans.*)

45. TRICHOCOLEA, Dumort.

150. **T. tomentella,** (Ehrh.) Dumort.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) At Hamilton Farm, River Rouge, Argenteuil Co., Que. (*D'Urban.*) In moss in Dow's swamp, Ottawa, Ont.; at Meech's Lake, north of Chelsea, Que.; in tamarac and black ash swamps, Belleville, Hastings Co., Ont.; in boggy woods, Câche Lake, Algonquin Park, Ont., June 9th, 1900. (*Macoun.*)

46. DIPLOPHYLLEIA, Trevis.

151. **D. albicans,** (Linn.) Trevis.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) On earth at Pictou, Nova Scotia, July 24th, 1883; crevices of wet rocks,

Margaree and Half-Way Brook, Cape Breton Island, N.S., 1898 ; on damp rocks in a ravine, Woodstock, N.B., July, 1899 ; on rocks northeast coast of Lake Superior, July 27th, 1869 ; on rocks, Roger's Pass, Selkirk Mountains, B.C.; on rocks, Mount Benson, Nanaimo, Vancouver Island ; near the summit of Mount Arrowsmith, alt. 5,500 feet, Vancouver Island. (*Macoun.*) Rocky Mountains. (*Bourgeau.*) Queen Charlotte Islands, B.C. (*Law.*) St. Paul Island, Behring Sea, and Carmanah, west coast of Vancouver Island, 1892. (*J. M. Macoun.*) Hot Springs, Mount Verstovia, Orca, Columbia Fiord, Port Wells, Farragut Bay and Barlow Cove, Alaska. (*Evans.*)

152. **D. taxifolia,** (WAHL.) TREVIS.

Labrador. Collected by Waghorne. (*Underwood.*) On moss and rocks, Pirate's Cove, Canso, N.S., July 9th, 1883 ; wet rocks, Smoky Mountain and Half-Way Brook, Cape Breton Island, N.S., 1898 ; on rocks, Ste. Anne des Monts River, Gaspé Co., Que. ; on rocks, Burnt Portage, Dawson Route, west of Lake Superior, July 24th, 1872 ; on wet rocks at Revelstoke, Columbia River, B.C. ; mountains of the Gold Range, north of Griffin Lake, B.C. ; on rocks at Peace River Cañon, Lat. 56° 12′, Oct. 24th, 1872 ; on rocks, Mount Benson, and in brooks, Nanaimo, Vancouver Island. (*Macoun.*) On damp rocks, Carmanah, west coast of Vancouver Island, 1892, and on St. Paul Island, Behring Sea, 1891. (*J. M. Macoun.*) St. Matthew Island, Unalaska Island, Cape Nome and Sitka, Alaska. (*Evans.*) On rocks, Cañon City, Alaska, March 27th, 1898. (*Williams.*) Unalaska. (*Chamisso.*)

153. **D. argentea,** (TAYL.)

Observatory Inlet, northwest coast of America. (*Dr. Scouler.*) Northwest coast of America, 1791. (*Menzies.*) Forward Bay, Johnston's Strait, Gulf of Georgia, B.C., 1885. (*Dr. G. M. Dawson.*)

154. **D. obtusifolia,** (HOOK.) TREVIS.

On earth under stumps at Hastings, Burrard Inlet, B.C., April 11th, 1889 ; on earth under a stump in woods, at Revelstoke, Columbia River, B C. (*Macoun.*)

155. **D. plicata,** (LINDB.) EVANS.

Orca, Farragut Bay and Hall Island, Alaska. (*Evans.*)

47. SCAPANIA, Dumort.

156. **S. Bolanderi,** AUST.

On logs and stones, Pirate's Cove, Canso, N.S.; on rocks at Truro, N.S.; on stones in brooks near Ottawa, Ont.; on logs in swamps, Sudbury Junction, Algoma; on rocks near Michipicoten, northeast coast Lake Superior; on trees at Hastings, Burrard Inlet, B.C.; on rocks Mount Erskine, Salt Spring Island, Gulf of Georgia, B.C.; on rocks and trees near Victoria, on trees at Nanaimo, on rocks, Mount Arrowsmith and Mount Mark, and on trees at Comox, Vancouver Island. (*Macoun.*) On logs, Alert Bay, Vancouver Island, and Hanson Island, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*) On logs, Chilliwack Lake, B.C.; Port Etches, Alaska, May 18th, 1892; Prince of Wales Island, 1891. (*J. M. Macoun.*) Sitka, Hot Spring, Mt. Verstovia, Juneau, Douglas Island, Orca, Columbia Fiord, Farragut Bay and Kadiak Island, Alaska. (*Evans.*) Chilcat, Alaska. (*Krause.*)

157. **S. nemorosa,** DUMORT.

S. subalpina, Pearson, List Can. Hep., p. 15.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) On stones, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Digge's Island, Hudson Strait. (*Dr. R. Bell.*) On earth, Jupiter River, Anticosti; on wet earth by roadsides and on rocks by streams, Cape Breton Island, N.S., July, 1898; not rare on Sable Island, N.S., July, 1899; on old logs, Mount Albert, Gaspé Co., Que.; on rotten wood by a brook, Meech's Lake and Cascades, Que., near Ottawa, Ont.; on flat rocks, Addington Co., Ont.; on rocks in damp places, Algonquin Park, Ont., June, 1900; on rocks, borders of brooks, opposite Michipicoten Island, Lake Superior; on damp rocks, House Mountain, Lesser Slave Lake, Atha.; on rocks by a brook, Roger's Pass, Selkirk Mountains, B.C.; on rocks in a brook at Revelstoke, Columbia River, B.C.; in wet woods at Hastings, Burrard Inlet, B.C.; on damp rocks at Goldstream and Parson's Mountain, near Victoria, Vancouver Island; on Mount

Arrowsmith, Vancouver Island, alt. 4,800 feet. (*Macoun.*) British Columbia. (*Lyall.*) Alaska. (*Krause.*) Reported from Alaska by Rothrock.

158. **S. Oakesii,** AUST.

Observatory Inlet, northwest coast of America. (*Dr. Scouler.*) Northeast coast, Lake Superior, July 28th, 1869. (*Macoun.*)

159. **S. undulata,** (LINN.) DUMORT.

On earth, Seal Lake, Labrador, July, 1896. (*A. P. Low.*) Labrador. Collected by Waghorne. (*Underwood.*) Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) Greenland, Lat. 63° 20′, May 27th, 1888. (*Dr. Rosenvinge.*) On rocks, Canaan Forks, Queen's Co., N.B. (*Moser.*) On wet earth, Point de Roche, Prince Edward Island; on rocks in a brook at Halifax and at Yarmouth, N.S.; on stones in flowing water at Baddeck, Margaree, Half-Way Brook and Louisburg, Cape Breton Island, N.S., July, 1898; in the bed of a brook, Mount Albert, Gaspé Co., Que.; in a small brook near the lower end of Michipicoten Island, northeast coast Lake Superior, July 26th, 1869; on earth along the Columbia River at Revelstoke, B.C.; on stones, Roger's Pass, Selkirk Mountains, B.C.; wet rocks near Griffin Lake, Gold Range, and on rocks at Yale, B.C.; in bogs near New Westminster, B.C.; near the summit of Mount Arrowsmith, Vancouver Island, alt. 5,500 feet. (*Macoun.*) On stones in brooks, Tulameen River, B.C. (*Dr. G. M. Dawson.*) Rocky Mountains. (*Lyall.*) Observatory Inlet, northwest coast of America. (*Dr. Scouler.*) Sitka, Juneau, Virgin Bay, Orca, Columbia Fiord, Farragut Bay, Yakutat Bay, Unalaska and Popoff Island, Alaska. (*Evans.*) St. Paul Island, Behring Sea, 1892. (*J. M. Macoun.*) In streams running into Lake Lindeman, Yukon, 1898. (*Williams.*)

160. **S. uliginosa,** (SW.) DUMORT.

Greenland. (*J. Vahl.*) On stones in brooks, Roger's Pass and along Asulcan Creek, Selkirk Mountains, B.C.; on stones in Eagle River, Griffin Lake, B.C., and on the Gold Range north of that point; on Mount Arrowsmith, near the summit, Vancouver Island. (*Macoun.*) On wet rocks, Carmanah Bay, Vancouver Island; Attu Island and St. Paul Island, Behring Sea. (*J. M. Macoun.*)

161. **S. irrigua,** (NEES) DUMORT.

On earth by roadsides, Brackley Point, Prince Edward Island ; on wet earth by springs at Truro, N.S. ; on boggy ground summit of Mount Albert, alt. 4000 feet, Gaspé Co., Que. ; on stones in brooks northeast coast of Lake Superior ; along Peace River, Rocky Mountain Cañon, Lat. 56° 12′, Oct. 24th, 1872 ; by springs at Quesnel, Fraser River, B.C. (*Macoun.*) Port Clarence, Alaska. (*Evans.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

162. **S. umbrosa,** (SCHRAD.) DUMORT.

S. convexa, (Scop.) Pearson, List Can. Hep. p. 15.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) On old logs, Sea's farm, and at Parson's bridge near Victoria ; on old logs at Goldstream, on rotten wood, Mount Mark, and on old logs at Comox, Vancouver Island. (*Macoun.*) Sitka, Mt. Verstovia, Juneau, Orca, Columbia Fiord and Yakutat Bay, Alaska. (*Evans.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

163. **S. imbricata,** M. A. HOWE, Bull. New York Bot. Gar. Vol. II., 104, 1901.

On rocks, Crater Lake, at foot of Chilcoot Pass, Alaska, alt. about 900 metres, May 24th, 1898. (*Williams.*)

164. **S. curta,** (MART.) DUMORT.

On earth, South West Point, Anticosti ; on earth along Ste. Anne des Monts River, Gaspé Co., Que. ; on old logs at Ottawa, Ont. ; on slate rocks 10 miles south of Fort William, Lake Superior, July 16th, 1869 ; on rocks, Nipigon River, and Lake Nipigon, Ont. ; on old logs, Sudbury Junction, Algoma, Ont. ; on earth, House Mountain, Lesser Slave Lake, Atha. (*Macoun.*) Unalaska Island. (*Chamisso.*) Yakutat Bay, Unalaska and St. Michael's, Alaska. (*Evans.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

165. **S. gracilis,** (LINDB.) KAALAAS.

On rocks by a brook, Big Intervale, Margaree, Cape Breton Island, N.S., July 14th, 1898. (*Macoun.*) Scoresby Sound, East Greenland. (*C. Jansen.*)

166. **S. brevicaulis,** Tayl.

North America. (*Drummond* in herb. Hook.)

167. **S. glaucocephala,** (Tayl.) Aust.

On dead wood, Gaspé coast, and slopes of Mount Albert, alt. 4,000 feet, Gaspé Co., Que. ; on elm and other logs at Ottawa, Ont. ; on old logs at Belleville, Hastings Co., Ont. ; on old logs, very rare, near Wooler, Northumberland Co., Ont., July 20th, 1865 ; on old logs, Manitoba House, Lake Manitoba, Man. ; on old logs west of Fraser River at Quesnel, B.C., 1875. (*Macoun.*)

168. **S. compacta,** (Roth) Dumort.

Greenland. (*Currie & Brentel.*)

48. RADULA, Dumort.

169. **R. complanata,** (Linn.) Dumort.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) On the bases of trees, Jupiter River, Anticosti ; on the bases of trees, Ste. Anne des Monts River, Gaspé Co., Que.; on rocks and trees at Ottawa, Ont.; on the roots of trees and on stones at Belleville, Hastings Co., Ont.; on rocks and trees, Queenston Heights, Ont., 1901 ; on rocks, Lake Nipigon, Ont.; abundant on the bases of trees in Algonquin Park, Ont., July, 1900 ; on trees, Red Deer River, Porcupine Mountains, Man.; on bases of trees and alders at Revelstoke, B.C.; on rocks, New Westminster, B.C.; on trees, Sea's farm, Victoria, Vancouver Island ; on rocks and trees, Mount Benson, Nanaimo, Vancouver Island ; on rocks and the bases of trees, Cape Breton Island, N.S., July, 1898 ; on the bases of trees, Roger's Pass, Selkirk Mountains, B.C., July 30th, 1890. (*Macoun.*) Sitka, Unalaska Island and Yakutat Bay, Alaska. (*Evans.*)

Radula Krausei, Steph., from Chilcoot, Alaska, is doubtfully referred here by Dr. Howe.

170. **R. Bolanderi,** Gottsche.

On rotten wood, Alert Bay, Vancouver Island, 1885. (*Dr. G. M. Dawson.*) On *Acer circinatum* at Hastings, Burrard Inlet, B.C.;

on Douglas Fir and other young trees at Victoria, and on *Alnus rubra* at Comox, Vancouver Island. (*Macoun.*) Hot Spring, Unalaska and Sitka, Alaska. (*Evans.*)

Radula arctica, Steph., collected at Chlowak and Chilcat, Alaska, by the Drs. Krause, is referred here by Dr. Howe.

171. **R. tenax,** LINDB

On the bark of trees, Alert Bay, Vancouver Island, 1885. (*Dr. G. M. Dawson.*)

49. PORELLA, Dill.

172. **P. navicularis,** (LEHM & LINDB.) LINDB.

Observatory Inlet, British Columbia. (*Dr. Scouler.*) Vancouver Island. (*Dr. Lyall.*) Chilcoot, Alaska. (*Krause.*) On trees at Hastings, Burrard Inlet, B.C.; quite common on boulders in woods, on rocks, on old logs, and on trees in swamps at Victoria and on trees at Comox, Vancouver Island; on trees and rocks, Salt Spring Island, Gulf of Georgia; and on rocks at Yale, Fraser River, B.C. (*Macoun.*) On trees, Alert Bay, Vancouver Island. (*Dr. G. M. Dawson.*) Hot Spring, Alaska. (*Evans.*)

173. **P. platyphylla,** (LINN.) LINDB.

A very common species throughout eastern Canada.

At the base of trees, Canaan Forks, and Never's Rapids, Queen's Co., N.B. (*Moser.*) On rocks, North West Arm, Halifax, N.S.; on trees at Yarmouth, N.S.; on rocks and trunks at Margaree, Cape Breton Island, N.S., July, 1898; on trees at Grand Etang, Gaspé Co., Que.; on trees at Ottawa, Ont.; on rocks at Sudbury Junction, Algoma; on trees and rocks at Belleville, Hastings Co., Ont.; on rocks at Owen Sound, Ont.; Nipigon River, Ont.; on trees, Queenston Heights, Ont., 1901; on trees in woods, Câche Lake, Algonquin Park, Ont., June 6th, 1900. (*Macoun.*) On trees, River Rouge, Argenteuil Co., Que. (*D'Urban.*) On Missinaibi River, Algoma. (*Dr. R. Bell.*) Guissen, Alaska. *Krause.*)

174. **P. rivularis,** (NEES) TREVIS.

P. platyphlloidea, Pearson's List, No. 20.

On wet rocks, Moose Mountain, Elbow River, alt. 6,000 feet, Rocky Mountains, July, 1897 ; on rocks, Selkirk Mountains, and in Roger's Pass, B.C., 1890 ; on trees along the Fraser River, near Mission, B.C. ; on rocks at Yale, Fraser River, B.C., 1872 ; on damp rocks, Eagle Pass, and on rocks at Revelstoke, and Robson, Columbia River, B.C.; on stones in the Colquitz River and on young firs near Victoria, Vancouver Island. (*Macoun.*) Sitka, and Yakutat Bay, Alaska. (*Evans.*)

175. **P. Roellii,** STEPH., Bot. Centralb. 45, 1891.

On rocks, Pass Creek, Robson, B.C., June, 1890 ; on damp rocks in a ravine at Craigflower, near Victoria, and on rocks near the waterworks, Victoria, Vancouver Island, May 30th, 1893 ; on rocks on the summit of Mount Benson, near Nanaimo, Vancouver Island, June 8th, 1887 ; on rocks, Salt Spring Island, and at Nanaimo River, Vancouver Island, May, 1887 ; on rocks above Yale, B.C., May 17th, 1875. The latter specimen was referred to *P. laevigata* by Pearson, but after reading Dr. Howe's remarks in his work on the Hepatics of California we place it under this species. (*Macoun.*) On wet cliffs, Chilliwack River, B.C., 1901. (*J. M. Macoun.*)

176. **P. pinnata,** LINN.

On stones in Trent River, below Heely Falls, Northumberland Co., Ont.; on stones in a creek, Mr. Roy's farm, near Owen Sound, Ont.; on stones in brooks, Kakabeka Falls, west of Fort William, Lake Superior ; on stones in Bonnechère River, Golden Lake, Renfrew Co., Ont.; on the bases of trees subject to flood, shore of Lake Duchesne, above Britannia, near Ottawa, Ont., Oct. 27th, 1900. (*Macoun.*)

50. LEJEUNEA, Libert.

177. **L. cavifolia,** (EHRH.) LINDB.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) On cedar trees, Ste Anne des Monts River, Gaspé Co., Que.;

on moss and rocks along the right bank of the Moira, below the paper-mill dam, Belleville, Hastings Co., Ont.; on rocks at Câche Lake, Algonquin Park, Ont., July 12th, 1900. (*Macoun.*)

178. **L. patens,** LINDB.

On damp rocks, Big Intervale, Margaree, Cape Breton Island, N.S., July 20th, 1898. (*Macoun.*)

51. COLOLEJEUNEA, Schiffn.

179. **C. Biddlecomiæ,** (AUST.) EVANS.

On cedar trees in Dow's swamp, Ottawa, Ont., Sept. 21st, 1889; on cedar trees in woods east of Belleville, Hastings Co., Ont., Sept. 17th, 1870. (*Macoun.*)

180. **C. Macounii,** (SPRUCE.) EVANS.

On the bark of *Acer circinatum* and other small trees at Hastings, Burrard Inlet, B.C., April 8th, 14th, and 20th, 1889. (*Macoun.*)

52. FRULLANIA, Raddi.

181. **F. Oakesiana,** AUST., Proc. Acad. Phila. 1869, 226.

On balsam fir and black ash trees at Baddeck, Cape Breton Island, N.S., July 9th, 1898. (*Macoun.*) Apparently not rare in that locality.

182. **F. Bolanderi,** AUST.

F. Hallii, Aust.; Pearson, List Can. Hep. p. 2.

We have two specimens in our herbarium collected on May 7th, 1875, at Victoria, Vancouver Island, one of which was named *F. Hallii* by Austin and the other *F. Oakesiana.* Both are placed here. Other specimens were collected on dead *Spiræa discolor*, *Pyrus rivularis* and Douglas fir on Sea's farm, near Victoria, Vancouver Island, May, 1893; on small trees at Hastings, Burrard Inlet, B.C., April 26, 1889; on rocks, Deer Park, Arrow Lake, Columbia River, B.C., June 8th, 1890. (*Macoun.*)

183. **F. Eboracensis,** GOTTSCHE.

Very common on trees, sometimes on rocks.

On fir trees, Jupiter River, Anticosti; on birch and small ash trees at Truro, N.S.; on trees of various kinds, quite common, Cape Breton Island, N.S., July, 1898; on trees, Brackley Point and Cove Head, Prince Edward Island; at Woodstock, N.B., July, 1899; on fir and birch trees, Ste. Anne des Monts River, Gaspé Co., Que.; on bark of various trees at Ottawa, Ont.; on trees, Leamy's Lake, Hull, Que.; abundant at Belleville, Hastings Co.; on beech trees, Seymour West, Northumberland Co.; Sudbury Junction, Algoma; on rocks, Lake Nipigon, Ont.; on trees, Queenston Heights, Ont., 1901; common in Algonquin Park, Ont., August, 1900; on trees, Red Deer River, Porcupine Mountains, Man.; on trees at Hector, Rocky Mountains, B.C.; on trees, Cedar Hill, near Victoria, Vancouver Island. (*Macoun.*)

184. **F. Virginica,** GOTTSCHE.

On bark of trees, apparently rare in Canada.

New Brunswick. (*James.*) Near Belleville, Hastings Co., Ont., 1868; on old trees in James Terrill's woods, near Wooler, Ont., Oct. 16th, 1893. (*Macoun.*)

185. **F. Chilcootiensis,** STEPH.

Chilcoot, Alaska. (*Krause.*)

186. **F. Asagrayana,** MONT.

On trees and rocks, frequent in Canada.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) Charlottetown, Prince Edward Island. (*James.*) On trees, Tobique River, N.B. (*Hay.*) Bass River, Kent Co., N.B. (*Prof. Fowler.*) On birch trees, Gaspé Co., Que.; on balsam fir, Baddeck, Cape Breton Island, N.S., July, 1898; on fir trees at Woodstock, N.B., July 4th, 1899; on trees at Truro, N.S.; on rocks in Gull Lake, Frontenac Co., Ont.; on rocks, Sudbury Junction, Algoma, Ont.; not uncommon on tree trunks at Câche Lake, Algonquin Park, Ont., June, 1900. (*Macoun.*)

187. **F. Californica,** (AUST.) EVANS.

F. Asagrayana, Mont. var. *Californica,* Aust.; Pearson, List Can. Hep. p. 3.

On trees and rocks on the Pacific coast; on trees at Hastings, Burrard Inlet, B.C., April, 1889; on rocks, Parson's Mountain and on trees at Victoria, Nanaimo and Comox, Vancouver Island, 1893. (*Macoun.*)

188. **F. tamarisci,** (LINN.) DUMORT.

Miquelon Island, Gulf of St. Lawrence. (*Delàmare.*) Newfoundland. (*Waghorne.*) On rocks, Margaree, Cape Breton Island, N.S., July 22nd, 1898. The west coast form referred here in Pearson's list belongs to the next species. (*Macoun.*)

189. **F. Nisquallensis,** SULLIV.

On bark of young Douglas fir and other trees at Victoria; on the bark of yellow cedar Mount Mark, Qualicum, and on alder trees at Comox, Vancouver Island; on trees at Hastings, Burrard Inlet, B.C.; on rocks at Yale, B.C., May, 1889. (*Macoun.*) On trees at Carmanah, west coast of Vancouver Island, May 18th, 1892. (*J. M. Macoun.*) Chilcoot, Alaska. (*Krause.*) Cape Fox, New Metlakahtla, Sitka, Hot Springs, Wrangel, Orca and Yakutat, Alaska. (*Evans.*)

190. **F. Franciscana,** M. A. HOWE.

Sitka and Hot Springs, Alaska. (*Evans.*) This species will likely be found on Vancouver Island or indeed may now be included in *F. Californica.*

191. **F. Selwyniana,** PEARSON, List Can. Hep., p. 1, 1890.

This is a small reddish-brown species collected on the bark of *Thuya occidentalis,* near the mouth of Ste. Anne des Monts River, Gaspé Co., Que., Aug. 19th, 1882. (*Macoun.*) Not collected since in Canada but has been found in Ohio by Mr. W. C. Werner.

Order V. ANTHOCEROTACEÆ.

53. ANTHOCEROS, Linn.

192. **A. laevis,** Linn.

On wet banks, Canada. (*Underwood.*) Very abundant along the Bonnechère, below the hotel at Golden Lake, Ont., Sept. 26th, 1900 ; on an old road in woods, Arner, Essex Co., Ont., August 6th, 1901. (*Macoun.*)

193. **A. punctatus,** Linn.

Wet banks, Canada. (*Austin.*) On wet earth at Truro N.S., July, 10th, 1883. (*Macoun.*)

194. **A. fusiformis,** Aust.

On earth by the sides of ditches at Hastings, Burrard Inlet, B.C. ; quite common by ditches and in wet places on mountains at Goldstream, Nanaimo and Victoria, Vancouver Island. (*Macoun.*) On earth, Alert Bay, Vancouver Island. (*Dr. G. M. Dawson.*) Observatory Inlet. (*Scouler.*)

195. **A. stomatifer,** Aust.

On earth on the slope of the mountain at Sproat, Columbia River, B.C., June 24th, 1890 ; on earth in Stanley Park, Vancouver, B.C., Aug. 25th, 1893 ; on wet earth above Yale, Fraser River, B.C., May 17th, 1875. (*Macoun.*)

196. **A. Macounii,** Howe ; Bull. Torr. Bot. Club, Vol, XXV pp. 19, 20.

Thallus forming small dark green rosettes, 4-10 mm. in diameter, strongly undulate, crisped, subradiately inciso-laciniate or somewhat broadly lobed, rugose, pitted sometimes, slightly lamellate, ecostate, 6-8 cells in axile parts, cavernose, becoming at the margin gradually 3 or 2 stratose, now and then glandular-thickened ; surface-cells distinct, translucent, lightly protuberant, subrhombic, trapegoidal, or oblong-pentagonal.

Abundant on earth subject to flood in spring, near the head of the discharge of Leamy's Lake, Hull, Que., October 6th, 1889. Not since collected. (*Macoun.*)

LICHENES.

TRIBE I.—PARMELIACEI.

FAMILY I. USNEEI.

1. RAMALINA, Ach.

1. **R. reticulata,** (NOEHD.) KREMPELH.

This is a common species on *Quercus Garryana* in the neighbourhood of Victoria, Vancouver Island. Many of the specimens are much elongated and hang in festoons from the trees. (*Macoun.*) On trees, Henslow Island, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*)

This is a very remarkable species and as far as known does not extend north of Henslow Island, Gulf of Georgia. The reticulations are much larger in southern specimens.

2. **R. calicaris,** (LINN.) FR. var. **fraxinea,** FR.

Not uncommon on fence-rails, trees, &c. Distinguished by its wide and long-lobed thallus. Apothecia lateral.

Rather rare in woods at Big Intervale, Cape Breton Island, N.S., 1898 ; on balsam fir, Stittsville, near Ottawa, Ont., May, 1897 ; fence-rails at Belleville and Brighton, Ont. ; on trees, Lake Nipigon, Ont. ; on oak trees at Comox, Vancouver Island. (*Macoun.*) Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On spruce trees and a board fence, Edmonton, Ont. (*James White.*)

Var. **fastigiata,** (PERS.) FR.

Branches compressed and inflated, without soredia. Lobes of thallus crowded. Apothecia terminal or subterminal.

Not uncommon on old fences, old logs and trunks in woods at Ottawa, Belleville and Brighton, Ont.; on trunks, Algonquin Park, Ont., 1900; on oak trees at Comox, Vancouver Island. (*Macoun.*) On spruce trunks at Edmonton, Ont. (*J. White.*)

Var. **canaliculata,** Fr.

Lobes narrow and channelled. Apothecia attached just below the deflexed tips.

On trees throughout the eastern provinces; but rare.

On trees, New Brunswick. (*Prof. Fowler.*) At Truro, Nova Scotia; Gaspé Peninsula, Quebec; in the vicinity of Ottawa, Ont.; Algonquin Park, Ont., June, 1900; along the Nipigon River, Ont.; near Kananaskis Falls, Rocky Mountains. (*Macoun.*)

Var. **farinacea,** Schaer.

Thallus either flattened or rounded, generally much branched and finally attenuate; besprinkled with white powdery soredia; apothecia rare. Apparently the commonest form of the species. Common on both trees and rocks.

L'Anse au Clair, Labrador. (*Waghorne.*) On trees, Salt Lake, Anticosti; on rocks and trees, Rivière Ste. Anne des Monts, Gaspé, Que.; on trees, Brackley Point, Prince Edward Island; on old fences, Sable Island, N.S., July 27th, 1899; on trees and rocks, Big Intervale, on rocks at Louisburg, and on trees at Grand Narrows and Baddeck, Cape Breton Island, N.S.; on rocks and trees near Ottawa, Ont.; on rocks, Algonquin Park, Ont., June, 1900; on trees at Belleville, Ont.; on rocks, Thunder Bay, Lake Superior; on rocks Lake Athabasca; on trees, Hastings, Burrard Inlet, B.C.; Victoria and Comox, Vancouver Island. (*Macoun.*) Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On trees, Alert Bay and Thurlow Island, Vancouver Island. (*Dr. G. M. Dawson.*) On trees near Cape Beale, Vancouver Island. (*J. M. Macoun.*)

3. **R. minuscula,** Nyl.

R. pusilla, (Prev.) var. *geniculata*, Tuckerm.

On trees and branches; not rare.

Canada. (*A. T. Drummond.*) Arctic America. (*Hooker.*) Abundant on trees at the Big Intervale, Margaree River, Cape Breton Island, N. S.; near Ironsides on the road to Chelsea, Que.; on small trees, and branches, Lake Nipigon, Ont.; on small trees, Hastings, Burrard Inlet, B.C. ; on willows, Burnside Road, Victoria, Vancouver Island. (*Macoun.*)

4. **R. dilacerta,** HOFFM.

R. minuscula, f. *pollinariella*, NYL.

Eagle River, L'Anse au Mort, and Blanc Sablon, Labrador ; on branches of trees, Middle Arm, Newfoundland. (*Waghorne.*)

5. **R. pollinaria,** (WESTR.) ACH.

Bay of Exploits, Newfoundland. (*Waghorne.*) Unalaska Island, Behring Sea. (*J. M. Macoun.*)

6. **R. polymorpha,** ACH.

Quite common on trees in the Maritime Provinces.

On rocks, Newfoundland. (*Despreaux.*) On dead balsam fir at Baddeck, Big Intervale and Louisburg, Cape Breton Island, N. S. ; Jupiter River, Anticosti ; Brackley Point, Prince Edward Island ; Little Chlorodorme, Gaspé Co. Que. ; on old fence posts and boards Sable Island, N. S., July 27, 1899. (*Macoun.*) On islands in Behring Strait. (*Wright.*) On rocks St. Paul Island, Behring Sea. (*J. M. Macoun.*)

7. **R. cuspidata,** ACH.

A specimen referred here was collected on St. Paul Island, Behring Sea, Aug 18th, 1892, by Mr. J. M. Macoun. The plant is perfectly smooth, polished and shining. There is no sign of soredia and the apothecia is lateral. (No. 615.) On June 19, 1897, other specimens were collected on St. Paul Island by Mr. Macoun and referred here by Prof. Branth.

2. CETRARIA (ACH.) FR.

8. **C. tristis,** (WEB.) FR.

Alpine rocks. Arctic America. (*Richardson.*) On rocks, Digge's Island, Hudson Strait, 1885. (*Dr. R. Bell.*) On rocks, summit of

Mount Benson, Vancouver Island (*Macoun.*) Muir Glacier, Alaska, July 13th, 1897. (*T. Kincaid.*)

9. **C. Californica,** TUCKERM.

On trees on the summit of Mount Benson, Vancouver Island, alt. 3,300 feet. (*Macoun.*)

10. **C. aculeata,** (SCHREB.) FR

On earth and growing over mosses in alpine districts.

Greenland. (*Arct. Man.*) Arctic America. (*Hooker.*) Clearwater Lake, Labrador. (*A. P. Low.*) On rocks near Halifax, N. S. ; on eastern end of Cypress Hills, Assa. ; on rocks and earth along the Milk River, Assa., near Kenneday's Crossing ; in Crow's Nest Pass and along Jumping Pound and Bragg's creeks, Rocky Mountains ; Bow River Pass, Kananaskis Pass and Devil's Lake, Rocky Mountains ; on rocks Roger's Pass, Selkirk Mountains, B.C. ; on Stewart's Lake Mountain, B.C. ; on mountains at Spence's Bridge, B.C. ; on rocks Burnside Road, Victoria, and on Mount Arrowsmith, Vancouver Island. (*Macoun.*) On the Barren Grounds, Lat. 62° 50′, Long. 102° 45′, W. (*J. B. Tyrrell.*) St. Paul Island, Behring Sea. (*J. M. Macoun..*)

11. **C. odontella,** ACH.

Growing over mosses on rocks in Arctic America. (*Tuckerman.*) Greenland. (*Arct. Man.*) On rocks at Clearwater Lake, Labrador, July 12th, 1896. (*A. P. Low.*) On earth in Lat. 61° 30′, Long. 103° 30′, W., July 26, 1893. (*J. B. Tyrrell.*)

12. **C. ramulosa,** (HOOK.) TUCKERM.

Growing over mosses on alpine rocks.

Arctic America. (*Richardson.*) Rocky Mountains. (*Herb. Hooker.*) Digge's Island, Hudson Strait. (*Dr. R. Bell.*) Summit of Mount Niblock near Lake Agnes, Rocky Mountains. (*Macoun.*)

13. **C. madreporiformis,** (ACH.) MÜLL.

On earth in alpine districts.

On mountains in Bow River Pass, Rocky Mountains, 1879 ; on earth, summit of Sulphur Mountain Banff, alt. 7,500 ft., 1891 ;

along Bragg's Creek, Elbow River, Rocky Mountains, 1897, alt. 5,000 feet. (*Macoun.*) The latter specimens have been referred to var. *muricata* by Dr. Branth.

14. **C. arctica,** (HOOK.) TUCKERM.

Greenland. (*Arct. Man.*) Clearwater Lake and Whale River, Labrador, 1896. (*A. P. Low.*) Bear Lake and elsewhere in Arctic America. (*Richardson.*) Cape Prince of Wales, Digge's Island and Upper Savage Islands, Hudson Strait. (*Dr. R. Bell.*) Barren Grounds, Lat. 62° 45′, Long. 103°, W. (*J. W. Tyrrell.*) Summit of Mount Niblock, Lake Agnes, Rocky Mountains. (*Macoun.*) Emerald Lake, south of Laggan, Rocky Mountains, alt. 5,500 ft. (*Bean.*) St. Paul Island, Behring Sea, 1891. (*J. M. Macoun.*)

15. **C. Islandica,** (LIND.) ACH.

On earth in many places throughout the mountains and cooler parts of Canada.

Western Greenland. (*Warming.*) Greenland. (*Arct. Man.*) On earth, Baffin Land, north of Hudson Strait, 1896; North Bluff, Hudson Strait. (*Dr. R. Bell.*) Barren Grounds, Lat. 61°, Long. 104°, W. (*J. W. Tyrrell.*) Mount Albert, Gaspé Co., Que.; Mount Stewart, Prince Edward Island; on Bruce Peninsula, at Little Eagle Harbour, Ont., August, 1901; quite common along the north and east shores of Lake Superior; on earth in woods, Banff, Mount Aylmer, Devil's Lake and Hector, Rocky Mountains; in Roger's Pass, Selkirk Mountains, B. C.; common on the mountains at the head of the Elbow River and in the Crow's Nest Pass, Rocky Mountains; mountains at Spence's Bridge, B. C.; Gold Range at Griffin Lake and above the Sky Line Mine, Kootenay Lake, B.C.; on earth at Comox, Vancouver Island. (*Macoun.*) On Todd Mountain and on mountains south of Tulameen River, B. C. (*Dr. G. M. Dawson.*) Cape Vancouver and St. Paul Island, Behring Sea. (*J. M. Macoun.*)

Var. **crispa,** (ACH.)

On earth in alpine and sub-alpine districts.

Greenland. (*Arct. Man.*) At the Summit Lake, Manicouagan River, Que. and Whale River, Labrador. (*A. P. Low.*) Battle Har-

bour, Labrador. (*Waghorne.*) On earth Half-Way House, Cape Breton Island, N.S., August, 1898 ; on earth, Salt Lake, Anticosti, Aug. 10th, 1883. (*Macoun.*)

Var. **robusta,** (BRANTH)

St. Paul Island, Behring Sea, July 2nd, 1897. (*J. M. Macoun.*)

16. **C. hiascens,** (FR.) TH. FR.

Greenland. (*Arct. Man.*) Arctic America. (*Herb. Hooker.*) Newfoundland. (*Despreaux.*) North Shore of Lake Superior. (*Agassiz.*) Nottingham Island and Digge's Island, Hudson Strait ; on Baffin Land, north shore of Hudson Strait, July, 1897. (*Dr. R. Bell.*) On earth, L'Anse au Mort and west of Woodside, Newfoundland. (*Waghorne.*) Barren Grounds, Lat. 61° 25′, Long. 103° 30′, W. (*J. W. Tyrrell.*) On earth, Salt Lake, Anticosti; summit of Mount Albert, Gaspé Co., Que. (*Macoun.*) Middleton Island, Alaska, and St. Paul Island, Behring Sea. (*J. M. Macoun.*)

17. **C. Richardsonii,** (HOOK.) TUCKERM.

Prostrate on the ground.

Barren Grounds, north of Great Slave Lake. (*Richardson.*) On the Barren Grounds near Chesterfield Inlet, Hudson Bay, Aug. 1893. (*J. W. Tyrrell.*)

18. **C. cucullata,** (BELL.) ACH.

On earth in alpine and sub-alpine districts.

Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) Marble Island, Hudson Bay ; Digge's Island, Hudson Strait. (*Dr. R. Bell.*) L'Anse au Mort, Labrador, and Chimney Cove, Newfoundland. (*Waghorne.*) Barren Grounds, Lat. 62° 50′, Long. 102° 05′, W. (*J. W. Tyrrell.*) Summit of Mount Albert, Gaspé Co., Que. ; Sulphur Mountain, Banff and at the source of the Elbow River, Rocky Mountains. (*Macoun.*) On earth, St. Paul Island, Behring Sea. (*J. M, Macoun.*)

19. **C. nivalis,** (LINN.) ACH.

On earth in alpine and sub-alpine districts.

Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) Mansfield Island, Hudson Bay and Nain, Labrador ; on earth, Baffin

Land, north of Hudson Strait, 1896. (*Dr. R. Bell.*) L'Anse au Loup, Labrador ; and Chimney Cove, Newfoundland. (*Waghorne.*) Clearwater Lake and Whale River, Labrador, July, 1896 and 1898. (*A. P. Low.*) Barren Grounds, Lat. 62° 03′, Long. 103° 15′, W. (*J. B. Tyrrell.*) Parry Falls, Great Slave Lake, May 15th, 1900. (*J. W. Tyrrell.*) Fort Good Hope, Mackenzie River. N.W.T. (*R. G.McConnell.*) Thirty miles north of Arctic Circle on Peel River. (*Miss E. Taylor.*) Summit of Mount Albert, Gaspé Co., Que.; on the east end of Cypress Hills, Assa.; Bow River Pass, and on earth in woods at Banff and at the source of the Elbow River, Rocky Mountains. (*Macoun.*) Crow's Nest Pass, Rocky Mountains ; on mountains south of Tulameen River and on Todd Mountain, B.C. (*Dr. G. M. Dawson.*) St. George and St. Paul islands, Behring Sea. (*J. M. Macoun.*)

20. **C. Fahlunensis,** (Linn.) Schær.

Arctic America. (*Richardson.*) Newfoundland. (*Despreaux.*) On rocks, Tadousac, and on Owl's Head, Lake Memphremagog, Que. (*A. T. Drummond.*) Clearwater Lake, Labrador, July 12th, 1896. (*A. P. Low.*) On rocks, Bald Mountain, Tobique, N. B. (*Geo. U. Hay.*) On rocks, summit of Mount Albert, Gaspé Co., Que. ; on rocks, Câche Lake, Algonquin Park, Ont., July, 1900 ; on rocks above Michipicoten, northeast shore of Lake Superior ; summit of Mount Benson, near Nanaimo, Vancouver Island. (*Macoun.*)

21. **C. commixta,** (Nyl.) Th. Fr.

On St. Paul Island, Behring Sea, June 28th, 1897. (*J. M. Macoun.*)

22. **C. ciliaris,** (Ach.) Tuckerm.

Quite common on fence-rails, branches of spruce, tamarac and balsam trees, and occasionally on tree-trunks.

On birch trees, Canaan Forks, N.B. (*J. Moser.*) On trees at Salt Lake, Anticosti ; on tamarac in a swamp, Brackley Point, Prince Edward Island ; at Baddeck, Louisburg, Big Intervale and Half-Way Brook, Cape Breton Island, N.S.; on birch trees, Ste. Anne des Monts, Gaspé Co., Que.; common on fence-rails, stumps and trees at Ottawa, Belleville, Brighton and Peterboro,

Ont. ; on branches of trees in swamps, Algonquin Park, Ont., July, 1900 ; near Sudbury Junction and along the north shore of Lake Superior ; Lake Nipigon and westward to the Porcupine Mountains, Man. (*Macoun.*)

23. **C. platyphylla,** TUCKERM.

Not uncommon on trees at Victoria, and on Mount Benson, Vancouver Island. (*Macoun.*)

24. **C. sæpincola,** (EHRH.) ACH.

On trees, twigs and dead wood.

Arctic America. (*Richardson.*) Hudson Bay. (*Herb. Banks.*) On bark of *Betula* at Clearwater Lake, Labrador, 1896. (*A.P.Low.*) Greenland. (*Arct. Man.*) On twigs in the Mer Bleue, near Ottawa, Ont.; on *Betula pumila,* Lake Nipigon, Ont.; on twigs and bark of Douglas fir, Deer Park, Lower Arrow Lake, Columbia River, and on *Larix occidentalis* at "Sky Line" Mine, Hot Springs, Kootaney Lake, B.C.; at McLeod's Lake, B.C., Lat. 55°; on trees, Burnside Road, Victoria, Vancouver Island. (*Macoun.*) Northwest Coast. (*Menzies.*)

Var. **chlorophylla,** WAHL.

L'Anse au Clair Bay, Labrador. (*Waghorne.*) On dead spruce trees, Jumping Pound Creek, Rocky Mountains, 1897 ; on dead trunks, Telegraph Trail, west of Quesnel, B.C., 1875 ; on old fences at Burrard Inlet, B.C., 1889. (*Macoun.*) On trees on Thurlow Island, Gulf of Georgia, B.C., 1885. (*Dr. G. M. Dawson.*)

25. **C. lacunosa,** ACH.

On trees and fence-rails, not rare.

On trees, Bald Mountain, Tobique River, N.B., 1884. (*G. U. Hay.*) On trees, Canaan Forks, Queen's Co., N.B., 1889. (*J. Moser.*) On trees, Jupiter River, Anticosti, 1883 ; on old fence-rails at Buckingham, Que., 1896 ; on fence-rails at Belleville, Ont., 1868 ; on trees, Nipigon River, Lake Superior, 1884 ; abundant on trees, Algonquin Park, Ont., June, 1900 ; on trees, Johnstone Harbour, Bruce Peninsula, Ont., Aug., 1901 ; on trees at Hastings, Burrard Inlet, B.C., 1889. (*Macoun.*) On dead cedars, Alert Bay, Van-

couver Island, and on Thurlow Island, Gulf of Georgia, B.C., 1885. (*Dr. G. M. Dawson.*) On St. George, St. Paul and Unalaska islands, Behring Sea, 1897. (*J. M. Macoun.*)

26. **C. glauca,** (LINN.) ACH.

On trees and rocks.

Newfoundland. (*Despreaux.*) White Bear River, Sandwich Bay, Newfoundland. (*Waghorne.*) On trees at Truro, N.S., 1883; on rocks at Louisburg ; and on trees at Baddeck, Big Intervale and at Half-Way Brook, Cape Breton Island, N.S., 1898 ; on birch trees, Skickshock Mountains, Gaspé Co., Que., 1882 ; on trees, Ste. Anne des Monts River, Que., 1882 ; on trees along the Nipigon River, Lake Superior, Ont., 1884 ; on spruce trees, Jumping Pound Creek, and Devil's Lake, Rocky Mountains ; on trees at Deer Park, Arrow Lake, Columbia River ; Câche Creek, Revelstoke and Clinton, B.C.; on trees and rocks at Victoria, Nanaimo and Comox, Vancouver Island. (*Macoun.*) Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*) On trees at Alert Bay, Vancouver Island. (*Dr. G. M. Dawson.*) On trees at Sitka, Alaska. (*J. M. Macoun.*)

Var. **stenophylla,** TUCKERM.

On old logs, Burnside Road near Victoria ; on trees at Qualicum and Nanaimo, Vancouver Island. (*Macoun.*) On trees Thurlow Island, Gulf of Georgia. (*Dr. G. M. Dawson.*) On the Sumas Prairie, B.C., 1859. (*Dr. Lyall.*)

27. **C. chrysantha.** TUCKERM.

On rocks, Kotzebue Sound. (*Tuckerman.*) On islands of Behring Strait. (*Wright.*)

28. **C. Oakesiana,** TUCKERM.

On trees and pine stumps in woods.

On the north shore of Lake Superior. (*Agassiz.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On bark of trees, North Bay, Lake Nipissing, 1884 ; on a pine stump in Rockcliffe Park, Ottawa, and at Stittsville, Carleton Co., Ont.; on a pine log, King's Mountain, Chelsea, Que. ; abundant on the bases of hemlock and pine trees, Algonquin Park, Ont., June, 1900. (*Macoun.*)

29. **C. aurescens,** TUCKERM.

On spruce trees, North Bay, Lake Nipissing, Ont. Determined by Tuckerman. (*Macoun.*) On Middleton Island, Alaska, June 15th, 1892. (*J. M. Macoun.*)

30. **C. juniperina,** (LINN.) ACH.

On trees, especially conifers.

Greenland. (*Arct. Man.*) On bark of Douglas fir, Deer Park, Lower Arrow Lake, Columbia River, B.C. ; on spruce trees, Nachaco River, northern British Columbia ; Mount Erskine, Salt Spring Island, Gulf of Georgia, B.C. (*Macoun.*)

Var. **terrestris,** SCHÆR.

On earth in alpine districts.

Arctic America. (*Herb. Hooker.*) On the summit of Mount Albert, alt. 4,000 feet, Gaspé Co., Que., 1882 ; abundant in the Rocky Mountains in the Bow River Pass, at Banff, at Kananaskis and Hector,on Moose Mountain and in the Crow's Nest Pass (*Macoun.*)

Var. **Pinastri,** ACH.

On trees, shrubs and rocks in sub-alpine or cool districts.

Arctic America. (*Richardson.*) Newfoundland. (*Waghorne.*) On spruce bark, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On bark, Bald Mountain, Tobique River, N.B. (*G. U. Hay.*) On rocks, Tadousac, Que. (*A. T. Drummond.*) On Rigaud Mountain, Vandreuil Co., Que. (*Rev. G. Ducharme.*) On shrubs, Gunn River, Anticosti ; on stumps and old fence-rails at Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898 ; on old rails, Port Daniel, Bonaventure Co., Que.; rather rare on rocks, Algonquin Park, Ont., July 21st, 1900 ; on boulders in woods, mouth of Nipigon River and along the shore of Lake Superior ; on dead sticks at Jumping Pound Creek and Bragg's Creek, foothills of Rocky Mountains, June 13th, 1897 ; at Donald, Columbia Valley, B.C. ; near McLeod's Lake, northern British Columbia. (*Macoun.*) On twigs of shrubs, Lat. 62° 03′, Long. 103° 15′, W. (*J. W. Tyrrell.*)

3. EVERNIA, Ach., Mann.

31. **E. vulpina,** (Linn.) Ach.

A very common species in the Rocky Mountains above 5,000 feet altitude. We have specimens, generally in fine fruit, from Crow's Nest Pass, Bow River Pass, Moose Mountain, Devil's Lake Mountains and Sulphur Mountain at Banff; Deer Park, Arrow Lake, Columbia River; mountains at Spence's Bridge, B.C.; at lower altitudes at Parson's Mountain near Victoria, Vancouver Island. (*Macoun.*) On Douglas fir on Todd Mountain, B.C., alt. 6,500 feet. (*Dr. G. M. Dawson.*)

32. **E. furfuracea,** (Linn.) Mann.

Rather rare in Canada and seldom collected.

On trunks of trees, Deer Park, Lower Arrow Lake, Columbia River, B.C., June 6th, 1890. (*Macoun.*)

33. **E. prunastri,** (Linn.) Ach.

Arctic America. (*Richardson.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On trees at Edmonton, Ont. (*J. White.*) Quite common in Ontario on old fences and always sterile. On old pine stumps and fences as well as on trees at Ottawa, Ont.; on fence-rails at Belleville and Brighton, Ont.; on trees at Chalk River, Renfrew Co.; Algonquin Park, Ont., June, 1900; on trees at North Bay, Lake Nipissing, and on trees along the Nipigon River, Lake Superior; on trees, Duck Mountain and Lake Winnipegosis, Manitoba; on trees at Morley and Jumping Pound Creek, foothills of Rocky Mountains; on rocks at Yale, B.C.; on trees at Victoria and Comox, Vancouver Island. (*Macoun.*) Pacific Coast. (*Menzies.*)

Var. **gracilis,** Ach.

On dry earth on a hillside at Farewell Creek, Cypress Hills, Assa.; not uncommon, June 27th, 1895. (*Macoun.*)

34. **E. divaricata,** (Linn.) Ach.

On branches of spruce trees in the swamps near Banff, Rocky Mountains; on spruce trees Mount Forget-me-not, Elbow River, Rocky Mountains, alt. 7,000 feet, July 14th, 1897. (*Macoun.*)

4. USNEA, (Dill.) Ach.

35. **U. sulphurea,** (Müll.) Th. Fr.

On rocks, Greenland. (*J. Vahl.*) Rocks, Arctic America; dwarfed and sterile, Melville Island. (*Parry's 2nd voyage.*)

36. **U. barbata,** (Linn.) Fr. var. **florida** Fr.

The variety or form, *hirta*, is very common. but *florida* is rare in Canada. On dead wood, North West Arm, Halifax, N.S., June 20th, 1883. (*Macoun.*)

Specimens, without fruit, very glaucous and nearly smooth, have been collected on trees in Crow's Nest Pass, Rocky Mountains, alt. 4,000 feet, Aug., 1897, and on Douglas fir at Comox, Vancouver Island, May 3, 1887. The latter were referred to typical *U. barbata* by Dr. Eckfeldt.

Var. **hirta,** Fr.

Very common on trees and old fences.

On a sandy point in the Bay of St. George, Newfoundland. (*Waghorne.*) On trees, Bass River, Kent Co., N.B. (*Prof. Fowler.*) On dead branches, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On spruce trees at Edmonton, Ont. (*James White.*) On trees at Truro, N.S.; on trees, Brackley Point, Prince Edward Island; on spruce trees, Cape Breton Island, N.S., but rare; on trees and old fences at Ottawa, Ont.; on fence-rails Belleville and Brighton, Ont.; on balsam fir, Algonquin Park, Ont., June, 1900; on trees, Lake Nipigon, Ont.; on trees, Manitoba House and Porcupine Mountains, Man.; on trees at Morley, foothills of Rocky Mountains; on spruce trees, C. P. R. station, Banff, and at Jumping Pound Creek, Rocky Mountains; on branches and trunks, Deer Park, Lower Arrow Lake, Columbia River, B.C.; on oak trees around Victoria, Vancouver Island. (*Macoun.*)

Var. **rubiginea,** Michx.

On trees at Round Lake, Ottawa Co., Que. (*D'Urban.*) On trees in a swamp near Belleville, Ont. (*Macoun.*) On spruce trees at Edmonton, Ont. (*James White.*)

Var. **ceratina,** SCHAER.

On trees, Ste. Anne des Monts River, Gaspé Co., Que.; rather common in spruce woods at Baddeck and other parts of Cape Breton Island, N.S.; on trees, Lake Nipigon, Ont.; on balsam fir Algonquin Park, Ont., June, 1900; in a swamp, C.P.Ry. station, Banff, Rocky Mountains; along Jumping Pound Creek and in the Crow's Nest Pass, Rocky Mountains; on trees at Hastings, Burrard Inlet, B.C.; on trees at Comox, Vancouver Island; on trees near Victoria, Vancouver Island. (*Macoun.*)

Var. **dasypoga,** FR.

Forteau Bay, Labrador; Shoal Point Bay, Wild Cove, Little Harbour, Frenchman's Cove and Bay Bull's Arm, Newfoundland. (*Waghorne.*) On trees along Jupiter River, Anticosti; on trees, Truro, N.S.; on trees, Lake Superior; on trees in woods, Duck Mountain, Man.; on spruce trees, Jumping Pound Creek, foothills of Rocky Mountains; on trees at Hastings, Burrard Inlet, B.C.; on trees, Sea's farm, Victoria, Vancouver Island. (*Macoun.*)

Var. **plicata,** FR.

On trees. summit of Mount Albert, Gaspé Co., Que.; on spruce trees, Baddeck and Big Intervale, Cape Breton Island, N.S.; on trees in Algonquin Park, Ont., June, 1900; on trees, Current River, Lake Superior; at Morley and Jumping Pound Creek, foothills of Rocky Mountains; on spruce trees, Bow River Pass, Rocky Mountains; on trees at Revelstoke, B.C.; on trees at Hastings, Burrard Inlet, B.C. (*Macoun.*)

Var. **articulata,** ACH.

On trees at Burrard Inlet, B.C., April 23rd, 1889; at Victoria, Vancouver Island, May 7th, 1875. (*Macoun.*)

Var. **hirtella,** ARN.

On a sandy point in the Bay of St. George, Newfoundland. (*Waghorne.*)

37. **U. angulata,** ACH.

On trees, Round Lake, Ottawa Co., Que. (*D'Urban.*) On trees around Lake Superior; on tamarac in the "Big Swamp," Murray, Northumberland Co., Ont. (*Macoun.*)

38. **U. trichodea,** Ach.

On trees, Nova Scotia. (*Menzies* fide *Tuckerman.*) On trees in woods, Baddeck, Cape Breton Island, July 9th, 1898 ; also on fir trees, Gaspé coast, Quebec. (*Macoun.*) On trees at Carmanah Bay, Vancouver Island. (*J. M. Macoun.*)

39. **U. longissima,** Ach.

Newfoundland. (*Herb. Hooker.*) On trees, Kent Co., N.B. (*Prof. Fowler.*) On trees, Tadousac, Que. (*A. T. Drummond.*) North shore of Lake Superior. (*Agassiz.*) On trees, Halifax, N.S. ; abundant on trees in woods at Baddeck and other localities, Cape Breton Island, N.S., July, 1898 ; on balsam fir, Algonquin Park, Ont., June, 1900 ; on trees, North Bay, Lake Nipissing ; north-east coast of Lake Superior ; on trees, Hastings, Burrard Inlet, B.C. ; on trees, Burnside Road, Victoria, Vancouver Island. (*Macoun.*) Alaska. (*Dr. Kellogg.*)

40. **U. cavernosa,** Tuckerm.

On trees, north shore of Lake Superior. (*Agassiz.*) On spruce trees, Lake Nipigon ; on trees at Banff, Rocky Mountains ; on spruce trees at Victoria, Vancouver Island. (*Macoun.*) British Columbia. (*Dr. Lyall.*)

5. BRYOPOGON, Link.

41. **B. divergens,** (Ach.)

On earth in alpine and arctic regions.

Greenland. (*Vahl.*) Newfoundland. (*Herb. Delessert.*) Long Island, Newfoundland. (*Waghorne.*) Clearwater Lake, Labrador, July 12th, 1896. (*A. P. Low.*) Marble Island, Hudson Bay and Digge's Island, Hudson Strait. (*Dr. R. Bell.*) Barren Grounds, Lat. 62° 30′, Long. 103° 15′, W., 1893. (*J. W. Tyrrell.*) Great Bear Lake. (*Richardson.*) On rocks, Parson's Mountain, Victoria, Vancouver Island, 1893. (*Macoun.*) Kotzebue Sound, Alaska. (*Herb. Church.*) Islands of Behring Strait. (*Wright.*)

42. **B. bicolor,** (Ehrh.)

Greenland. (*J. Vahl.*) Emily Harbor, Labrador. (*Waghorne.*)

43. **B. jubata,** (LINN.) var. **prolixa,** (ACH.) Th. Fr

Red Bay, Independent and Blanc Sablon, Labrador. (*Waghorne.*) On spruce trees at Baddeck, Cape Breton Island, N.S., 1898; on earth, Nipigon River, Ont., July, 1884; Morley, foothills of Rocky Mountains, June, 1885; on trees near the railway station, at Banff and on spruce trees, Jumping Pound Creek, Alta., Rocky Mountains; at Revelstoke, B.C., May 16th, 1890. (*Macoun.*) Unalaska, Aleutian Islands, Behring Sea, August 21st, 1891. (*J. M. Macoun.*)

We have not seen Mr. Waghorne's specimens, but all the others referred here are fuscus-black, rigid and covered with white soredia. They are very different from the usual forms of *chalybeiformis.*

Var. **chalybeiformis,** (ACH.)

On earth in alpine districts.

Greenland. (*J. Vahl.*) On earth, Baffin Land, north of Hudson Strait, 1896. (*Dr. R. Bell.*) Clearwater Lake, Labrador, July 21st, 1896. (*A. P. Low.*) Quite common on spruce trees at Big Intervale and Half-Way Brook, Cape Breton Island, N.S., July, 1898; on fence-rails at Belleville, Ont.; in swamps, Algonquin Park, Ont., July, 1900; on earth, Cypress Hills, Assa.; on earth, Jumping Pound Creek, foot-hills of Rocky Mountains; on trees and mountains by Kootenay Lake, B.C.; on mountains south of Spence's Bridge, B.C.; on trees, summit of Mount Benson, Nanaimo, B.C., July, 1893. (*Macoun.*) On earth, St. Paul Island, Behring Sea. (*J. M. Macoun.*)

Var. **implexa,** FR.

On trees throughout Canada.

Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) Notre Dame Bay, Newfoundland, and Blanc Sablon, Labrador. (*Waghorne.*) On trees, Tadousac, Que. (*A. T. Drummond.*) Barren Grounds, Lat. 61° 13′, Long. 104′, W. (*J. W. Tyrrell.*) On trees in many parts of Cape Breton Island, N.S., 1898; Truro, N.S.; Brackley Point, Prince Edward Island; along Gunn River, Anticosti; on spruce trees, Algonquin Park, Ont., June, 1900; Current River, Lake Superior and Nipigon River, Ont.; Porcupine Moun-

tains, Man.; Crow's Nest Pass, Rocky Mountains ; on trees at Donald, Columbia Valley, B.C. ; along the Columbia River at Revelstoke, B.C. ; at Hastings, Burrard Inlet, B.C. ; at Victoria, on Mount Benson and at Comox, Vancouver Island. (*Macoun.*) Todd Mountain, B.C. (*Dr. G. M. Dawson.*) Skeena River, B.C.; St. Paul Island, Behring Sea, 1892. (*J. M. Macoun.*)

44. **B. Fremontii,** (TUCKERM.)

On the branches of coniferous trees.

On *Larix occidentalis,* Arrow Lakes, Columbia River, B.C.; on trees in swamps at Sicamous, B.C., July 7th, 1889 ; on spruce trees, Stewart's Lake, B.C.; on Douglas Fir, Mount Benson, Nanaimo, Vancouver Island. (*Macoun.*) Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*) British North America. (*Drummond.*)

6. ALECTORIA, (Ach.) NYL.

45. **A. ochroleuca,** (EHRH.) var. **rigida,** FR.

Both arctic and alpine.

Greenland. (*Arct. Man.*) Greenland. (*Branth.*) On earth in Arctic America. (*Richardson.*) Ford's Harbor, Labrador ; Cape Chudleigh and Nottingham Island, Hudson Strait ; on earth, Baffin Land, north shore of Hudson Strait, 1896. (*Dr. R. Bell.*) L'Anse au Mort and Blanc Sablon, Labrador. (*Waghorne.*) Clearwater Lake, Labrador, 1896 ; Summit Lake, Manicouagan River, Que., 1895. (*A. P. Low.*) Newfoundland. (*Despreaux.*) Barren Grounds, Lat. 62° 03′, Long. 103° 15′, W. (*J. W. Tyrrell.*) On the summit of Mount Albert, Gaspé Co., Que. (*Macoun.*) Vancouver Island. (*Herb. Hooker.*)

46. **A. sarmentosa,** (ACH.) NYL.

On coniferous trees. Common on the Pacific Coast.

Greenland. (*Branth.*) Cape Forteau, Leading Tickle and Blanc Sablon, Labrador. (*Waghorne.*) On spruce and fir trees in woods at Baddeck and Big Intervale, Cape Breton Island, N.S., July, 1898 ; Salt Lake, Anticosti ; Kicking Horse Lake and Moose Mountain, near source of Elbow River, Rocky Mountains ; Donald, Columbia River, B.C.; Asulcan Glacier, Selkirk Mountains, B.C.; near McLeod's Lake, northern British Colum-

bia ; Hastings, Burrard Inlet, B.C.; on Douglas fir at Victoria, Nanaimo and Comox, Vancouver Island. (*Macoun.*) Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*) Pease Island, Gulf of Georgia, Vancouver Island. (*Dr. G. M. Dawson.*) Skeena River, B.C., and Port Etches, Alaska. (*J. M. Macoun.*)

Var. **cincinnata,** Fr.

On earth in Greenland. (*Dr. Branth.*) Near Independent, Labrador. (*Waghorne.*) On earth (fertile), Newfoundland. (*Despreaux.*) Digge's Island, Hudson Strait, and North Bay, Hudson Bay, Aug., 1885. (*Dr. R. Bell.*)

47. **A. nigricans,** Ach.

Greenland. (*Arct. Man.*) On earth (fertile), Labrador, and Newfoundland, (fertile). (*Despreaux,* On earth, Clearwater Lake, Labrador, July, 1896. (*A. P. Low.*) Near L'Anse au Loup, Labrador. (*Waghorne.*) Ford's Harbor, Labrador ; Mansfield Island, and Marble Island, Hudson Bay. (*Dr. R. Bell.*) Summit of Mount Albert, Gaspé Co., Que.; on earth, summit of Gold Range, near Griffin Lake, B.C. (*Macoun.*) St. Paul Island and St. George Island, Behring Sea. (*J. M. Macoun.*)

Family II. PARMELIEI.

7. THELOSCHISTES, Norm.

48. **T. chrysophthalmus,** (Linn.) Norm.

On trees and fence-rails along large bodies of water.

On trunks along Lake Ontario at Wellington Beach and Presqu'ile Point ; on fence-rails, Port Rowan, Lake Erie ; on trees, Pelee Point, Essex Co., Ont., May 27th, 1901 ; on trees, Lake Winnipegosis, Man. (*Macoun.*)

Var. **flavicans,** Wallr.

Coast of Newfoundland. (*Nylander.*)

49. **T. parietinus,** (Linn.) Norm.

On trunks and stones near large bodies of water.

Newfoundland, 1826. (*Pylaie.*) Shores of Lake Superior. (*Agassiz.*) Very abundant on roofs of houses and old board

fences, Sable Island, N.S., July 27th, 1899; on trees, Presqu'ile Point, Lake Ontario; on stones along Lake Winnipegosis, Man. (*Macoun.*)

50. **T. polycarpus,** (EHRH.) TUCKERM.

On trees, dead wood, fence-rails and old boards.

On bark, Turner's Head, Labrador. (*Waghorne.*) On Rigaud Mountain, Vandreuil Co, Que. (*Rev. G. Ducharme.*) On trees at Campbellton, N.B.; dead wood, Jupiter River, Anticosti; on spruce twigs at Grand Narrows, and abundant on old fence-rails, Big Intervale, and on "fish flakes" McNeill's Harbour, Cape Breton Island, N.S., July, 1898; on bitter-nut hickory trees, at Belleville, Ont.; on trees, Red Rock, Nipigon Bay, Lake Superior; abundant on trees at Winnipeg and Stony Mountain, Man.; on trunks, Red Deer River, Lake Winnipegosis, Man.; on poplar trees, Moose Mountain, Assa. (*Macoun.*) On scrub oaks, Greenwood, Man. (*Thos. Walker.*) On maple and elm trees at Edmonton, Ont. (*James White.*)

51. **T. lychneus,** (NYL.) TUCKERM.

On trees and stones and old fence-rails.

Greenland. (*Branth.*) On oak bark, High Park, Toronto, 1901; on cedar bark, Pelee Point, Essex Co., May 27th, 1901; abundant on choke-cherry trees, Old Wives' Creek, Assa., May, 1895; on old cedar fences at Hastings, Burrard Inlet, B.C.; on old fence-rails at Cadboro Bay and Comox, and on poplar trees and dead wood at Victoria, Vancouver Island. (*Macoun.*) St. Paul Island, Behring Sea. (*J. M. Macoun.*) On rocks, islands in Behring Strait. (*Wright.*) Alaska. (*Dr. Kellogg.*)

52. **T. concolor,** (DICKS.) TUCKERM.

On trees and rocks.

On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) Abundant on black ash trunks in McKay's woods and other places at Ottawa, Ont.; on basswood trunks at Carleton Place, Carleton Co., Ont.; and on basswood and ash trees, Seymour West, Northumberland Co., Ont.; on trees at Hastings, B.C., April, 1889. (*Macoun.*)

8. PARMELIA, (Ach.) De Not.

53. **P. perlata.** (Linn.) Ach.

Chiefly on old trunks of trees in swamps ; sometimes on rocks.

On rocks, Bald Mountain, Tobique River, N.B. (*G. U. Hay.*) Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On trunks of trees in woods, Big Intervale, Margaree, Cape Breton Island, N.S., 1898; on birch trees, Truro, N.S.; on trunks of trees, Gaspé Co., Que. ; on trunks at Beechwood, Ottawa, Ont.; on trees at Chelsea, Que.; on trees at Belleville, Ont.; on old rails, Seymour West, Northumberland Co., Ont., 1893 ; on a fallen balsam in a swamp at Guelph, Ont. ; on trees by Lake Erie at Leamington, Essex Co., Ont., May 29th, 1901 ; not uncommon, Algonquin Park, Ont., June, 1900; on trees, Goulais Point, Lake Superior. (*Macoun.*) Lake Superior. (*Agassiz.*)

54. **P. perforata,** (Jacq.) Ach.

On trees and stones.

On trees at Belleville, Ont. ; on trees at Burrard Inlet, B.C., April 24th, 1889. (*Macoun.*) On a mountain at Spence's Bridge, B.C., 1892. (*James McEvoy.*) Pacific coast. (*Menzies.*)

55. **P. cetrata,** Ach.

On an elm trunk in a swamp at Carleton Place, Ont., May 12th, 1900 ; on the timbers of the old wharf at Comox, Vancouver Island. (*Macoun.*) Near Cape Beale, Vancouver Island. (*J. M. Macoun.*)

56. **P. crinita,** Ach.

On trees and rocks.

On trunks, Central Ontario Junction, Hastings Co., Ont. ; on old rails by woods, Seymour West, and on trunks, Brighton, Northumberland Co., Ont. ; on trees, Johnstone's Harbour, Bruce Peninsula, Lake Huron, Aug. 22nd, 1901. (*Macoun.*) On a beech tree at Credit Forks, Ontario Co., Ont. (*Thos. Walker.*)

57. **P. tiliacea,** (HOFFM.) FLOERK.

On trees and stones ; commonly on beech and spruce trees.

Ste. Anne des Monts River, Gaspé Co., Que. ; on beech trees, Big Intervale, Margaree, Cape Breton Island, N.S., July 1898; on trees in numerous places around Hull, Que., and Ottawa, Ont.; Paugan Falls, Gatineau River, Que. ; on trees, Terrill's farm, near Wooler, Ont.; on birch trunks, Algonquin Park, Ont., July, 1900. (*Macoun.*) On bark of trees, Canaan Forks, N.B. (*J. Moser.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*)

58. **P. Borreri,** TURN.

On trees and dead wood ; rare. Only collected in the neighbourhood of Ottawa, Ont. (*Macoun.*)

Var. **rudecta,** TUCKERM.

On dead wood at Ottawa, Ont.; on old rails, Brighton, Northumberland Co., Ont., Oct., 1893. (*Macoun.*) On maples at Edmonton, Ont. (*J. White.*) On old rails, Big Intervale, Margaree, Cape Breton Island, July, 1898 ; on trunks, Algonquin Park, Ont., June, 1900 ; on bark at Niagara Falls and Pelee Point, Ont., 1901. (*Macoun.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*)

59. **P. saxatilis,** (LINN.) FR.

Common on trees, dead wood, fences and rocks.

Greenland. (*Warming.*) On trees, Bald Mountain, Tobique River, N.B. (*G. U. Hay.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) Common on old logs on Cape Breton Island, N.S., and in woods, fruiting abundantly ; old logs, Truro, N.S.; on trees, Ste. Anne des Monts River, Gaspé Co., Que. ; on trees, Jupiter River, Anticosti, Que.; on old rails and trees at Ottawa and Belleville, Ont.; on trunks, Algonquin Park, Ont., June, 1900 ; on trees, North Bay, Lake Nipissing ; on trees, Lake Nipigon, Ont.; on trees, Red Deer River, Man.; on spruce trees, Jumping Pound Creek, and in the Crow's Nest Pass, Rocky Mountains ; on trees, Deer Park, Columbia Valley, B.C.; on rocks, Hastings, Burrard Inlet, B.C.; on trees, Burnside Road, Victoria, and on Mount Benson, Nanaimo, Vancouver Island. (*Macoun.*) On earth and logs, Fort Rupert, Vancouver Island. (*Dr. G. M. Dawson.*) Chilliwack Valley, B.C. ; St. Paul and St. George islands, Behring Sea. *J. M. Macoun.*)

Var. **sulcata,** NYL.

On trees, dead wood, fences and rocks.

On old boards and posts, Main Station, Sable Island, N.S., July, 1899 ; on trees, Jupiter River, Anticosti, and along the Gaspé coast, Que.; not uncommon on old logs, fence-rails and trunks, at Ottawa, Ont.; on fence-rails, near Wooler, Ont.; on rocks, Lake Nipigon, Ont.; on old logs, Jumping Pound Creek, Rocky Mountains ; on rocks, Deer Park, Columbia Valley, B.C.; on trees and old logs, Hastings, Burrard Inlet, B.C.; on oak trees, Burnside Road, Victoria, and on the old wharf at Comox, Vancouver Island. (*Macoun.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) St. George Island, Behring Sea, and Middleton Island, Alaska. (*J. M. Macoun.*)

Var. **panniformis,** (ACH.) SCHÆR.

Greenland. (*Arct. Man.*) Arctic America. (*Herb. Hooker.*) L'Anse au Clair and Battle Harbour, Labrador. (*Waghorne.*) On rocks, Lake Nipigon, Ont., July 17th, 1884. (*Macoun.*)

Var. **omphalodes,** FR.

On rocks in alpine districts.

Greenland. (*Arct. Man.*) On rocks at Louisburg, Cape Breton Island, N.S., July, 1898 ; on rocks, Moose Mountain, Rocky Mountains, alt. 6000 feet ; on rocks, Deer Park, Columbia Valley, B.C. (*Macoun.*) On rocks, St. Paul Island, Cape Vancouver and Unalaska Island, Behring Sea. (*J. M. Macoun.*)

Var. **furfurascens,** SCHÆR.

On rocks, Blanc Sablon, Labrador. (*Waghorne.*)

60. **P. physodes,** (LINN.) var. **vulgaris,** KÖRB.

Greenland. (*Arct. Man.*) Greenland. (*Warming.*) On trees, Clearwater Lake, Labrador, July, 1896. (*A. P. Low.*) On spruce twigs, Lat. 61°, Long. 104°, W. (*J. W. Tyrrell.*) On dead wood, Canaan Forks, N.B. (*J. Moser.*) Spruce trees, Lake Mistassini, northern Quebec, June, 1885. (*J. M. Macoun.*) On old boards, Main Station, Sable Island, N.S., July, 1899 ; quite common on trunks of trees, rails and old logs, Cape Breton Island, N.S., July,

1898; on rocks and dead wood, seldom fertile, on trees commonly so, Percé, Bay des Chaleurs, Bonaventure Co., Que.; on ash and other trees at Ottawa, Ont.; on trunks at Belleville, Ont.; on fence-rails at Brighton, Ont.; on old fence-rails, Seymour West, Northumberland Co., Ont.; on rocks, North Bay, Lake Nipissing; Algonquin Park, Ont.; June, 1900; on trees, Thunder Bay, Lake Superior; on dead wood and rocks, Nipigon River, Ont.; on trees along Jumping Pound Creek and Bragg's Creek, Rocky Mountains; on trees at Donald, B.C., July 6th, 1885; on rocks, Devil's Lake, Rocky Mountains; on old logs, Hastings, Burrard Inlet, B.C.; on rocks near Victoria, and on the old wharf at Comox, Vancouver Island. (*Macoun.*) On trees, New Westminster, B.C. (*Law.*) On dead wood, Alert Bay, Vancouver Island. (*Dr. G. M. Dawson.*)

Var. **obscurata,** Ach.

L'Anse au Mort, Labrador. (*Waghorne.*) Alpine rocks, Arctic America. (*Herb. Hooker.*) On rocks on Moose Mountain, alt. 6,000 feet, Rocky Mountains, July 2nd, 1897. (*Macoun.*) Islands of Behring Strait. (*Wright.*)

Var. **enteromorpha,** Tuckerm.

Blanc Sablon, Labrador. (*Waghorne.*) Very abundant on trees around Victoria, at Nanaimo, Qualicum, and Comox, Vancouver Island; on trees at Hastings, Burrard Inlet, B.C.; on trees near McLeod's Lake, northern British Columbia. (*Macoun.*) On trees, Fort Rupert, Vancouver Island. (*Dr. G. M. Dawson.*) Chelliwack Valley, B.C. (*J. M. Macoun.*)

Var. **vittata,** Ach.

Bay Bull Arm, Trinity Bay and Goose Arm, Newfoundland. (*Waghorne.*) On spruce trees along Ste. Anne des Monts River, Gaspé Co., Que. (*Macoun.*) At Carmanah, near Cape Beale, Vancouver Island. (*J. M. Macoun.*)

61. **P. encausta,** (Smith) Nyl.

Alpine rocks, Greenland. (*Vahl.*) Labrador. (*Waghorne.*)

Var. **alpicola,** Nyl.

A blackened alpine condition.
Greenland. (*Vahl.*) Labrador. (*Waghorne.*)

62. **P. colpodes,** (Ach.) Nyl.

On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On trees, Central Ontario Junction, Hastings Co., Ont., Oct. 22nd, 1893; on trees, chiefly tamarac, in a swamp near Ottawa, Ont., and on trees, King's Mountain, Chelsea, Que. (*Macoun.*)

63 **P. olivacea,** (Linn.) Ach.

Greenland. (*Branth.*) On trees, Arctic America. (*Richardson.*) On trees, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On alders at Baddeck and Big Intervale, and on rocks, Cape Breton Island, N.S., July, 1898; on alders, Ste. Anne des Monts River, Gaspé Co., Que.; rather common on bark of trees, especially alder, at Ottawa, Ont.; on trees, Nipigon River, Ont.; on trees along Jumping Pound Creek, Rocky Mountains, June, 1897; on trees at Morley, Jumping Pound Creek, and Kananaskis, Rocky Mountains; on alder bushes, Revelstoke and Blackwater River, and Hastings, Burrard Inlet, B.C.; on poplar trees, Sea's farm, Victoria, Vancouver Island. (*Macoun.*) Athabasca River. (*J. M. Macoun.*)

Var. **aspidota,** Ach.

On rocks, coast of Newfoundland, 1893. (*Waghorne.*)

Var. **prolixa,** Ach.

On rocks, shores of Lake Nipigon, July, 1884; on rocks Spence's Bridge, B.C., May, 1889. (*Macoun.*)

Var. **panniformis,** Nyl.

On rocks on Parson's Mountain, near Victoria, Vancouver Island, May 17th, 1893. (*Macoun.*)

Var. **sorediata,** (Ach.) Nyl.

On fence boards, Sable Island, N.S., 1899; Baddeck, Cape Breton Island, N.S., 1898; on alders near Hull, Que., 1891, and on fence-rails, Rideau Park, Ottawa, Ont., 1887; on old cedar rails, Hastings Co., Ont., 1868; on fence-rails, Seymour West, Northumberland Co., Ont., 1893; on rocks near Galt, Ont.; in

Algonquin Park, Ont., 1900; on rocks, Câche Lake, Algonquin Park, Ont., July, 1900; on rocks, Nipigon River, Ont.; on rocks, Blackwater River, B.C.; on alders, Hastings, B.C., 1889. (*Macoun.*)

A form found on *Alnus incana* and on fences, with us, always infertile, is placed under var. *sorediata* because the specimens are more or less sorediate, with white powdery granules on the margins of the divisions of the thallus.

64. **P. stygia,** (Linn.) Ach.

Alpine and subalpine rocks.

Greenland. (*Branth.*) Arctic America. (*Richardson.*) Newfoundland. (*Pylaie.*) Labrador. (*Waghorne.*) On rocks, Tadousac, Que. (*A. T. Drummond.*) On rocks, Deer Park, Columbia River, B.C., 1890; on sandstone rocks along Jumping Pound Creek, Rocky Mountains, June, 1897. (*Macoun.*)

65. **P. lanata,** (Linn.) Wallr.

Greenland. (*Branth.*) Arctic America. (*Richardson.*) Melville Island. (*R. Brown.*) Labrador. (*Waghorne.*) On the summit of Mount Benson, alt. 3,000 feet, Nanaimo, Vancouver Island, July 10th, 1893. (*Macoun.*)

66. **P. caperata,** (Linn.) Ach.

Trunks, dead wood and stones, quite common.

On old rails, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) Arctic America. (*Richardson.*) On trees, Tobique River, N.B. (*G. U. Hay.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On old fences around Ottawa, Ont.; at Belleville, Brighton and Nipigon River, Ont.; on trunks at Jordan Station, Lincoln Co., Ont., May 17th, 1901; on basswood trees at Guelph, Ont., 1898; on trunks, Algonquin Park, Ont., 1900; on dead wood, Manitoba House, Man.; on dead wood at Morley, Rocky Mountains. (*Macoun.*) On board fences at Edmonton, Ont. (*James White.*)

67. **P. conspersa,** (Ehrh.) Ach.

On rocks and stones and sometimes on dead wood.

Greenland. (*Branth.*) Arctic America. (*Richardson.*) Labrador. (*Waghorne.*) On rocks, Barren Grounds, Lat. 61°, Long.

104°, W. (*J. W. Tyrrell.*) On rocks, Never's Rapids, Queen's Co., N.B. (*J. Moser.*) On boulders, Carleton Co., N.B. (*G. U. Hay.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) Dry rocks, Stony Lake, Peterboro' Co., Ont. (*Thos. Walker.*) On boulders, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898; on boulders along Ste. Anne des Monts River, Gaspé Co., Que.; on boulders in woods around Ottawa, Ont.; very common in Algonquin Park, Ont., 1900; on rocks on Moose Mountain and in Crow's Nest Pass, Rocky Mountains; on rocks, Blackwater River, B.C.; on rocks and old logs, Deer Park, Columbia Valley. B.C.; on rocks at Hastings, Burrard Inlet. B.C.; on rocks, Burnside Road, Victoria, Vancouver Island. (*Macoun.*)

68. **P. molliuscula,** Ach.

Not uncommon on earth in the southern parts of the prairie region from Manitoba to the Rocky Mountains; on earth at Old Wives Creek, Assa.; in the Bow River Pass at Morley, and by the lake in the Crow's Nest Pass, Rocky Mountains. (*Macoun.*)

69. **P. centrifuga,** (Linn.) Ach.

Alpine and subalpine rocks.

Greenland. (*Branth.*) Arctic America. (*Vahl.*) Digge's Island, Hudson Strait. (*Dr. R. Bell.*) Blanc Sablon, Labrador. (*Waghorne.*) Clearwater Lake, Labrador, July, 1896; Summit Lake, Manicouagan River, Que, 1895. (*A. P. Low.*) Newfoundland. (*Despreaux.*) Tobique River, N B. (*G. U. Hay.*) On rocks, Tadousac, Que. (*Drummond.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) Along the northeast coast of Lake Superior, and along Nipigon Lake and river. (*Macoun.*) North shore of Lake Superior. (*Agassiz.*)

70. **P. incurva,** (Pers.) Fr.

On granitic rocks, alpine and arctic. Greenland. (*Branth.*) Labrador. (*Waghorne.*)

71. **P. ambigua,** (Wulf.) Ach.

On trunks, dead wood and rocks.

Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) Trinity Bay, Newfoundland. (*Waghorne.*) On dead spruce logs at the

Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898 ; on dead bark at Banff, Rocky Mountains ; on dead logs, Jumping Pound and Bragg's creeks, Rocky Mountains, June, 1897 ; on old logs, Deer Park, Lower Arrow Lake, B.C.; on dead pine logs, northern British Columbia. (*Macoun.*)

Var. **albescens,** WAHL.

Greenland. (*Arct. Man.*) Birchy Cove and Eagle River, Newfoundland. (*Waghorne.*) On old logs and rails, Big Intervale, Margaree, Cape Breton Island, N.S., July 22nd, 1898. (*Macoun.*)

9. PHYSCIA, (DC., Fr.) Th. Fr.

72. **P. speciosa,** (WULF.) NYL.

Trees and mossy rocks in woods.

On trees and rocks in damp woods at Ottawa, Ont. ; on old rails in woods, Brighton, Ont.; on moss on rocks, Foster's Flats, Niagara Falls, May 16th, 1901 ; on stones along Nipigon River, Ont., July, 1884 ; on birch trunks, Algonquin Park, Ont., June, 1900. (*Macoun.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*)

73. **P. hypoleuca,** (MUHL.) TUCKERM.

On trunks in woods near Wooler, Northumberland Co., Ont., Oct. 16th, 1893 ; on rocks, Lake Nipigon, July 17th, 1884 ; on trunks, rare, Red Pine Lake, Algonquin Park, Ont., July 19th, 1900. (*Macoun.*)

74. **P. leucomela,** (LINN.) MICHX.

Labrador. (*Waghorne.*) On trees at Carmanah, near Cape Beale, Vancouver Island, May 9th, 1892. (*J. M. Macoun.*)

75. **P. ciliaris,** (LINN.) DC., var. **crinalis,** SCHÆR.

Newfoundland. (*Despreaux.*) L'Anse au Clair, Labrador. (*Waghorne.*) On rocks at Louisburg, Cape Breton Island, N.S.; on fence-rails, James Terrill's farm, Brighton, Ont.; on dead wood within the spray of Lake Ontario at Wellington Beach, Prince Edward Co., Aug. 14th, 1868 ; on rocks, Lake Nipigon, July, 1884 ; specimens with wider lobes and much whiter in color

have been gathered on earth on the prairie at Old Wives' Creek, Assa., May 30th, 1895. (*Macoun.*) On rocks, Lake Mistassini, northern Quebec, 1885. (*J. M. Macoun.*) Rocky Mountain and Arctic America. (*Richardson.*)

76. **P. aquila,** (Ach.) Nyl, var. **detonsa,** Tuckerm.

On rocks and trees.

On the bases of beech trees at Edmonton, Ont. (*James White.*)

77. **P. pulverulenta,** (Schreb.) Nyl.

On trunks and rocks, and sometimes on the earth.

Arctic America. (*Richardson.*) On earth, Greenland. (*Branth.*) On trees at Ottawa, Shannonville, Belleville and Brighton, Ont.; on rocks, Nipigon River, Ont.; on rocks in woods, Jumping Pound Creek, and at Banff, Rocky Mountains; on rocks, Deer Park, Columbia Valley, B.C.; on rocks, Blackwater River, B.C.; on earth and rocks at Lytton, B.C., April 17th, 1889. (*Macoun.*)

Var. **muscigena,** Schreb.

Greenland. (*Arct. Man.*) Newfoundland. (*Despreaux.*) Arctic America. (*Herb. Hooker.*) L'Anse au Mort and L'Anse au Clair, Labrador; Middle Arm, Newfoundland. (*Waghorne.*)

Var. **beucoleiptes,** Tuckerm.

On rocks, Little Fox River, Gaspé Co., Que.; on rocks, Nipigon River, Ont., June 1884; on rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C.; on rocks along Jumping Pound Creek, Rocky Mountains, June 14th, 1897. (*Macoun.*)

78. **P. stellaris,** (Linn.) Tuckerm.

On trees, dead wood, rocks and stones.

Greenland. (*Branth.*) Arctic America. (*Richardson.*) Independent, Labrador. (*Waghorne.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On trees, but not common, at Baddeck and Big Intervale, Cape Breton Island, N.S., July, 1898; on dead wood, Truro, N.S.; on trees, Ste Anne des Monts River, Gaspê Co., Que.; very common on trees and rails at Ottawa and Casselman, Ont.; at Belleville and Brighton, Ont.; on trees at Winnipeg and Manitoba House, Man.; along Old

Wives' Creek ; on poplar trees, Moose Mountain, Assa. and on Wood Mountain, Assa., 1895 ; on trees near Victoria, Vancouver Island, May, 1893. (*Macoun.*) On old rails and apple and plum trees, Edmonton, Ont. (*James White.*) On scrub oak, Greenwood, Man.; near Yorkton, Assa. (*Thos. Walker.*) Chamisso Island in Eschscholtz Bay ; Little Koniushi Island, of Shumagin Group; and Glacier Spit, Cook's Inlet, Alaska. (*Rothrock.*)

Var. **aipolia,** Nyl.

On bark of black ash, Seymour West, Northumberland Co., Ont.; on bark of trees at Ottawa, Ont., and at Aylmer, Que.; on trunks, Pelee Point, Essex Co., Ont., May 27th, 1901. (*Macoun.*) On maple and black ash trees, Edmonton, Ont. (*James White.*)

79. **P. astroidea,** (Fr.) Nyl.

On old rails and trunks of trees,

On old rails near Hintonburg, Ont.; abundant on the upper part of a fallen hemlock, near Hemlock Lake, McKay's woods, Ottawa, Ont., and on old rails at Aylmer, Que., May 22nd, 1897. (*Macoun.*)

80. **P. hispida,** (Schreb.) Tuckerm.

On trees, dead wood and rocks.

Arctic America. (*Richardson.*) On old rails, quite rare, Big Intervale, Cape Breton Island, N.S., July, 1898 ; on rocks at Campbellton, Restigouche River, N.B.; on boulders at Belleville, and fence-rails at Brighton, and on trees, Seymour West, Ont.; on poplar trees, Stony Mountain, Man.; on poplar bark, Sea's farm, Victoria, Vancouver Island. (*Macoun.*)

Var. **leptalea,** Ach.

Parmelia marina, E. Nyl.

Mullin's Cove, Labrador. (*Waghorne.*) On an old wharf at Comox, Vancouver Island, June 24th, 1893. (*Macoun.*)

81. **P. caesia,** (Hoffm.) Nyl.

On rocks, Greenland. (*Branth.*) On rocks, Long Island, Newfoundland. (*Waghorne.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On rocks, Câche Lake, Algonquin Park, Ont., July, 1900 ; on rocks, Lake Nipigon, Ont.; on rocks in

woods at Banff, Rocky Mountains ; on rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C.; on old fences, Hastings, Burrard Inlet, B.C. (*Macoun.*)

82. **P. tribacia,** (Ach.) Tuckerm.

East Ste. Modeste, Labrador. (*Waghorne.*) On red ash trees along Lake Duchesne, above Britannia, near Ottawa, Ont., Oct. 27th, 1900 ; abundant on oak trees, Pelee Point, Essex Co., Lake Erie, May 27th, 1901. (*Macoun.*)

83. **P. crispa,** (Pers.) Nyl.

Labrador. (*Waghorne.*)

84. **P. obscura,** (Ehrh.) Nyl.

On trees, dead wood and rocks.

Greenland. (*Branth.*) Arctic America. (*Richardson.*) Labrador. (*Waghorne.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On black ash trees at Edmonton, Ont. (*James White.*) On trees at Baddeck, Cape Breton Island, N.S., July, 1898, rare ; on trees at Ottawa, Ont.; on bark of trees at Hull, Que.; on ash trees at Belleville and on trees and fence-rails at Brighton, Ont.; on trunks of trees, Algonquin Park, Ont., June, 1900 ; on rocks, Lake Nipigon, Ont.; on trees at Red Rock, Lake Superior ; on trees, Lake Winnipegosis, Man.; on rocks, Jumping Pound Creek, Rocky Mountains, June 14th, 1897 ; in the Crow's Nest Pass, Rocky Mountains ; on rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C. (*Macoun.*)

Var. **endochrysea,** Nyl.

Labrador. (*Waghorne.*) On rocks, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On black ash trees near Ottawa, Ont., April, 1895 ; on moss on Laurentian rocks at Shannonville, Hastings Co., Ont., Sept. 20th, 1868. (*Macoun.*)

85. **P. setosa,** (Ach.) Nyl.

On mosses ; on rocks and trunks.

On trunks in woods at Brighton, Ont.; not uncommon on trunks in many places around Ottawa, Ont.; on trunks, Algonquin Park,

Ont., June, 1900; on rocks at Banff, Rocky Mountains; on dead trunks along Jumping Pound Creek, Rocky Mountains, June 12th, 1897. (*Macoun.*)

86. **P. adglutinata,** (FLOERK) NYL.

On beech trees in Beechwood cemetery, Ottawa, Ont., April 23rd, 1892. (*Macoun.*) Apparently rare in Canada

10. PYXINE, Fr., Tuckerm.

87. **P. sorediata,** FR.

On trees and rocks.

On trees, Tobique River, N.B. (*G. U. Hay.*) On trees at Baddeck, Cape Breton Island, N.S., July, 1898; on balsam, spruce and beech trees at Ottawa, Ont.; on dead wood at Belleville, and on beech trees at Brighton, Ont.; on old rails, Seymour West, Northumberland Co., Ont., Oct., 1893; on cedar bark, Algonquin Park, Ont., June, 1900. (*Macoun.*) On Rigaud Mountain, Vaudreuil, Co., Que. (*Rev. G. Ducharme.*) On poplar and red maple at Edmonton, Ont. (*James White.*)

FAMILY III. UMBILICARIEI.

11. UMBILICARIA, Hoffm.

88. **U. rugifera,** NYL.

Greenland. (*Giseke.*) Labrador. (*Waghorne.*) On rocks, Unalaska Island, Behring Sea, 1891, and abundant on St. Paul and St. George islands, Behring Sea, July, 1897. (*J. M. Macoun.*)

89. **U. cylindrica,** (LINN.) DELIS.

High alpine and arctic rocks.

Greenland. (*Vahl.*) Labrador. (*Herb. Schwein.*) Labrador. (*Waghorne.*) Newfoundland. (*Despreaux.*) Digge's Island, Hudson Strait; a small piece. (*Dr. R. Bell.*) Bear Lake. (*Herb. Hooker.*) On rocks, Moose Mountain, near the source of the Elbow River, Rocky Mountains, July 1st, 1897, alt. 6,500 feet. (*Macoun.*) Very fine specimens were gathered on St. Paul and St. George islands, Behring Sea, in July, 1897, by Mr. J. M. Macoun.

90. **U. proboscidea,** (LINN.) STENH.

Alpine rocks, Greenland. (*Vahl.*) Arctic America. (*Richardson.*) Digge's Island, Hudson Strait; also on Baffin Land, 1897. (*Dr. R. Bell.*) Battle Harbor and Sampson's Island, Labrador. (*Waghorne.*) Newfoundland. (*Despreaux.*) Summit of Mount Albert, Gaspé Co., Que.; on rocks, Moose Mountain, alt. 6,500 feet, Rocky Mountains; on rocks, Mount Benson, Nanaimo, Vancouver Island. (*Macoun.*) North shore of Lake Superior. (*Agassiz.*) St. Paul, St. George and St. Lawrence islands, Behring Sea. (*J. M. Macoun.*) St. Matthew Island, Alaska. (*Rothrock.*)

Var. **arctica,** ACH.

On rocks, Greenland. (*Vahl.*) Labrador. (*Waghorne.*) Newfoundland. (*Despreaux.*) Summit of Mount Benson, alt. 3,000 feet, Nanaimo, Vancouver Island. (*Macoun.*)

91. **U. anthracina,** (WULF.) SCHÆR.

On rocks, Greenland. (*Vahl.*) Labrador. (*Waghorne.*) Newfoundland. (*Despreaux.*) On rocks, summit of Mount Benson, near Nanaimo, Vancouver Island. (*Macoun.*)

Var. **reticulata,** SCHÆR.

Arctic America. (*R. Brown.*) On Nottingham Island, Hudson Strait, 1884. (*Dr. R. Bell.*)

92. **U. polyphylla,** (LINN.) HOFFM.

Alpine rocks, descending towards the north.

Greenland. (*Vahl.*) Labrador. (*Waghorne.*) Newfoundland. (*Despreaux.*) On rocks along Nipigon River and Lake; on rocks near the "Gap," Crow's Nest Pass, 1897; on rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C.; on rocks, Pier's farm, Victoria, Vancouver Island. (*Macoun.*) Mount Queest, Gold Range, B.C. (*J. M. Macoun.*) Unalaska Island, Alaska. (*Rothrock.*

Var. **deusta,** (LINN.) FR.

Grand Lake, Bay of Islands, Newfoundland. (*Waghorne.*)

93. **U. flocculosa,** HOFFM.

Alpine rocks, descending to lower altitudes towards the north. Greenland. (*Arct. Man.*) Bolster Rocks, Newfoundland. (*Waghorne.*) On rocks, along Half-Way Brook, Cape Breton Island, N.S., Aug., 1898; rather common on rocks at Câche Lake, Algonquin Park, Ont., July, 1900; on rocks, Nipigon River; on rocks at Sproat, Columbia River, B.C., 1890. (*Macoun.*) Rocky Mountains. (*Herb. Hooker.*) Behring Strait. (*Wright.*)

94. **U. hyperborea,** HOFFM.

On rocks, Greenland, 1884. (*Warming & Holm.*) Arctic America. (*Richardson.*) On rocks, Cape Chudleigh, Hudson Strait; also on Baffin Land, 1897. (*Dr. R. Bell.*) On rocks, Clearwater Lake, northern Labrador, 1897. (*A. P. Low.*) Labrador. (*Waghorne.*) Newfoundland. (*Despreaux.*) On gneiss rocks, Tadousac, Que. (*A. T. Drummond.*) On rocks along Jupiter River, Anticosti, Que.; on rocks, northeast coast of Lake Superior; on rocks, Moose Mountain, alt. 6,500 feet, and Crow's Nest Pass, Rocky Mountains; on rocks, Deer Park, Lower Arrow Lake, Columbia River, also at Lytton on Fraser River, B.C.; on rocks, summit of Mount Benson, near Nanaimo, Vancouver Island. (*Macoun.*) North shore of Lake Superior. (*Agassiz.*) Rocky Mountains. (*Herb. Hooker.*) Harbledown Island, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*)

95. **U. phæa,** TUCKERM.

On rocks, Parson's Mountain, near Victoria, Vancouver Island, May 17th, 1893. (*Macoun.*)

96. **U. erosa,** (WEB.) HOFFM.

Alpine rocks, descending towards the north. Greenland. (*Arct. Man.*) Arctic America. (*R. Brown.*) Labrador. (*Waghorne.*) Newfoundland. (*Despreaux.*) On gneiss rocks, Tadousac, Que. (*A. T. Drummond.*) Summit of Mount Albert, Gaspé Co., Que.; on rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C. (*Macoun.*) On rocks, St. George Island, Behring Sea, June 10th, 1897. (*J. M. Macoun.*)

97. **U. Muhlenbergii,** (ACH.) TUCKERM.

Arctic America. (*Richardson.*) On rocks, Clearwater River, northern Labrador, July, 1896. (*A. P. Low.*) L'Anse au Clair, Labrador ; Notre Dame Bay, Newfoundland. (*Waghorne.*) On rocks, Barren Grounds, Lat. 61°, Long. 104°, W. (*J. W. Tyrrell.*) On gneiss rocks, Tadousac, Que. (*A. T. Drummond.*) Granitic rocks, Nova Scotia. (*J. Moser.*) On rocks, Tobique River, N.B. (*G. U. Hay.*) On rocks, Jupiter River, Anticosti ; at Halifax, N.S.; on rocks, mouth of Rideau River, near Ottawa, Ont.; on rocks at Kingsmere, near Chelsea, Que.; on rocks, Paugan Falls, Gatineau River, Que.; on Britton's Island, Gull Lake, Victoria Co., Ont.; quite common on rocks in Algonquin Park, Ont., July, 1900 ; at Otter Head, Lake Superior. (*Macoun.*) Kingston Mills, Ont., 1901. (*J. M. Macoun.*) Granite rocks, Stony Lake, Peterboro' Co., Ont. (*Thos. Walker.*) On rocks, Savanne, west of Lake Superior, Oct., 1893. (*Lawson.*)

98. **U. vellea,** (LINN.) NYL.

On rocks on high mountains.

Greenland. (*Arct. Man.*) Labrador ; Shoal Point, Newfoundland. (*Waghorne.*) Newfoundland. (*Despreaux.*) On the face of a perpendicular cliff, King's Mountain, west of Chelsea, Que., May, 1897 ; very abundant on rocks, Câche Lake, Algonquin Park, Ont., June, 1900 ; on rocks, Lake Nipigon, Ont.; on rocks, Crow's Nest Pass, alt. 4,000 feet, Rocky Mountains ; three miles below Hector, Rocky Mountains ; at Pass Creek, Sproat's Landing, Columbia River, B.C.; Lake Mara, Sicamous, B.C.; on rocks, Moose Mountain, alt. 6,000 feet. (*Macoun.*) North shore of Lake Superior. (*Agassiz.*)

99. **U. Dillenii,** TUCKERM.

Newfoundland. (*Tuckerman.*) On rocks, Tobique River, N.B. (*G. U. Hay.*) North shore of Lake Superior. (*Agassiz.*) On the faces of perpendicular rocks, King's Mountain, west of Chelsea, Que., May, 1897; quite common on rocks, Câche Lake, Algonquin Park, Ont., June, 1900 ; on Britton's Island, Gull Lake, Victoria Co., Ont.; on rocks, northeast coast, Lake Superior. (*Macoun.*) On Rigaud Mountain, Vaudreuil Co., Que. *Rev. G. Ducharme.*

100. **U. angulata,** Tuckerm.

On rocks on the Pacific Coast.

Observatory Inlet, B.C. (*Herb. Hooker.*) On rocks, Parson's Mountain and Pier's farm, near Victoria, and on the summit of Mount Benson, Nanaimo, Vancouver Island, B.C. (*Macoun.*) On rocks, Chilliwack Valley, B.C. (*J. M. Macoun.*)

101. **U. Pennsylvanica,** Hoffm.

Greenland. (*Arct. Man.*) Arctic America. (*Richardson* fide *Tuckerman.*) Labrador. (*Waghorne.*)

102. **U. pustulata,** (Linn.) Hoffm. var. **papulosa,** Tuckerm.

Newfoundland. (*Despreaux.*) On rocks, Jupiter River, Anticosti ; on dry rocks, Britton's Island, Gull Lake, Victoria Co., Ont.; Otter head, northeast coast of Lake Superior ; very abundant on rocks, Algonquin Park, Ont., July, 1900. (*Macoun.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*)

103. **U. hirsuta,** (Ach.) Stenh. var. **grisea,** Fr.

Greenland. (*Branth.*) Newfoundland. (*Despreaux.*) Notre Dame Bay, Newfoundland *Waghorne.*) On rocks, Tadousac, Que. (*A. T. Drummond.*)

104. **U. spodochroa,** Hoffm.

Greenland. (*Arct. Man.*) On sea cliff, Osprey Beach, Bay of Islands, Newfoundland, July 2nd, 1895. (*Waghorne.*)

13. STICTA, (Schreb.) Fr.

105. **S. amplissima,** (Scop.) Mass.

On trunks of trees and rocks, quite common.

Arctic America. (*Richardson.*) Labrador. (*Waghorne.*) On trees at Canaan Forks and Never's Rapids, Queen's Co., N.B. (*J. Moser.*) On trees, Tobique River, N.B. (*G. U. Hay.*) Quite common at Baddeck and Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898 ; at Truro, N.S.; on trees, Jupiter River, Anticosti ; at Ste. Anne des Monts River, Gaspé Co., Que.; on trunks in woods, Ottawa, Ont.; at Belleville, Ont. ; on trees,

Foster's Flats, Niagara Falls, May 16, 1901 ; abundant on trunks of trees, Algonquin Park, Ont., June, 1900; at Goulais Point, east coast of Lake Superior. (*Macoun.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On trees at Credit Forks, near Toronto, and at Stony Lake, Peterboro' Co., Ont. (*James White.*)

106. **S. herbacea,** (HUDS.) ACH.

Labrador. (*Waghorne* fide *Eckfeldt.*)

107. **S. aurata,** (SMITH) ACH.

Labrador. (*Waghorne* fide *Eckfeldt.*)

108. **S. pulmonaria,** (LINN.) ACH.

On trees and rocks ; quite common.

L'Anse au Mort, Labrador. (*Waghorne.*) Newfoundland. (*Pylaie.*) On trunks, Bald Mountain, Tobique River, N.B. (*G. U. Hay.*) On *Empetum nigrum*, Sable Island, N.S. There are no trees on the island and this species and *S. scorbiculata* grow close to the ground on dead stems ; on trees at Baddeck and in many other places, Cape Breton Island, N.S., July, 1898 ; on rocks at Truro, N.S.; on trees, Jupiter River, Anticosti ; Ste. Anne des Monts River, Gaspé Co., Que.; on trees at Ottawa, Ont. ; at Belleville, Ont.; on trees, Jordan Station, Lincoln Co., Ont., May 17, 1901 ; on a fallen log in a swamp at Guelph, Ont.; on tree trunks in Algonquin Park, Ont., June, 1900 ; on trees Current River, Lake Superior ; on trees, Hastings, Burrard Inlet, B.C. ; common on trees at Victoria, Nanaimo and Comox, Vancouver Island. (*Macoun.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On trees along the River Rouge, Que. (*D'Urban.*) On bases of beech trees at Edmonton, Ont. (*James White.*) On beech trees, Norton's Wood, Brampton, Ont. (*T. Walker.*) Alert Bay, Vancouver Island. (*Dr. G. M. Dawson.*)

Var. **linita,** NYL.

On islands in Behring Strait. (*Wright.*) On rocks on St. Paul Island, Behring Sea ; on Prince of Wales Island, Alaska. (*J.M. Macoun.*) On rocks near Victoria, Vancouver Island, 1875. (*Macoun.*

109. **S. Oregana,** TUCKERM.

On trees (high up) in woods.

At Hastings, Burrard Inlet, B.C. ; on trees at Goldstream and Nanaimo, Vancouver Island. (*Macoun.*) Chilliwack Valley, B.C., 1901; on trees at Cape Beale, Vancouver Island; Port Etches and Prince of Wales Island, Alaska. (*J. M. Macoun.*) Alert Bay, Vancouver Island. (*Dr. G. M. Dawson.*)

110. **S. quercizans,** (MICHX.) ACH.

Northward to Canada, always infertile. (*Tuckerman.*) Labrador. (*Waghorne.*) We have no Canadian specimens in our herbarium.

111. **S. fuliginosa,** (DICKS.) ACH.

On rocks and trunks, British Columbia. (*Lyall.*) On rocks, Victoria Arm, near Victoria, Vancouver Island, May 6th, 1893. (*Macoun.*)

112. **S. limbata,** (SMITH) ACH.

Labrador. (*Waghorne* fide *Eckfeldt.*)

113. **S. crocata,** (LINN.) ACH.

On rocks among mosses, but occasionally on trees.

Quite common on trunks in woods at Baddeck, Cape Breton Island, N.S., July, 1898 ; on trees, Truro, N.S.; on rocks, Gaspé coast, Que.; on rocks, rare, Algonquin Park, Ont., July, 1900; on rocks, Thunder Bay, Lake Superior, and on rocks, Lake Nipigon, Ont.; on trees at Revelstoke, Columbia, River, and at Hastings, Burrard Inlet, B.C.; on rocks, Burnside Road, Victoria, Vancouver Island. (*Macoun.*)

114. **S. anthraspis,** ACH.

Among mosses on rocks, and on trunks.

On trunks, Mount Finlayson, and on Sea's farm, Victoria, and on rocks, Burnside Road, Victoria, Vancouver Island, 1893. (*Macoun.*) Deceit Bay and Redonda Island, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*)

115. **S. scorbiculata,** (Scop.) Ach.

Among mosses on rocks and on tree trunks.

Greenland. (*Branth.*) Labrador. (*Waghorne.*) Newfoundland. (*Pylaie.*) On trunks, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On rocks, Tadousac, Que. (*A. T. Drummond.*) On *Empetrum nigrum*, Sable Island, N.S., August 8th, 1899; on trees at Baddeck and Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898; on rocks, Truro, N.S.; on trees, Jupiter River, Anticosti; on trees, St. Anne des Monts River, Gaspé Co., Que.; on rocks, Algonquin Park, Ont., July, 1900; on trees at Revelstoke, B.C.; on rocks, Burnside Road, Victoria, Vancouver Island. (*Macoun.*) British Columbia. (*Lyall.*) On rocks, Pease Island, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*)

14. NEPHROMA, Ach.

116. **N. arcticum,** (Linn.) Fr.

Amongst mosses on rocks and on tree trunks in alpine and arctic regions.

Greenland. (*Retz.*) Arctic America. (*Richardson.*) On rocks, Clearwater Lake, Northern Labrador, 1896. (*A. P. Low.*) On rocks, Nain, Labrador. (*Dr. R. Bell.*) Labrador. (*Waghorne.*) Barren Grounds, Lat. 61° 13′, Long. 104°, W. (*J. W. Tyrrell.*) On rocks, Tadousac, Que. (*A. T. Drummond.*) Quite common on earth or rocks in woods, Smoky Mountain and Half-Way Brook, Cape Breton Island, N.S., Aug., 1898; on rocks, Becscie River, Anticosti; summit of Mount Albert, Gaspé Co., Que.; on rocks, Lake Agnes, and on earth in woods at Hector, Rocky Mountains; on rocks in Roger's Pass, Selkirk Mountains, B.C. (*Macoun.*) Northwest coast. (*Scouler.*) Cape Vancouver and Unimak Island, Behring Sea. (*J. M. Macoun.*)

117. **N. expallidum,** Nyl.

On earth, dead wood, etc., in the arctic regions.

Labrador. (*Waghorne.*) Great Bear Lake. (*Richardson.*)

118. **N. tomentosum,** (Hoffm.) Kœrb.

Tree trunks in mountain forests, and also on rocks.

On wood, Tobique River, N.B. (*G. U. Hay.*) On rocks at Shannonville, Hastings Co Ont.; on trees North Bay, Lake

Nipissing, Ont.; on both rocks and trunks of trees, Lake Nipigon, Ont., on perpendicular rocks, northeast shore Lake Superior; on trees, Manitoba House, Lake Manitoba, Man.; on trees and rocks at Revelstoke, B.C.; on rocks at Quesnel, Fraser River, B.C.; on trees at Hastings, Burrard Inlet, B.C.; common on trees around Victoria, Vancouver Island. (*Macoun.*) On rocks, Athabasca River, Atha. (*J. M. Macoun.*)

119. **N. Helveticum,** Ach.

On trees and rocks.

Arctic America. (*Richardson.*) On rocks, Ste. Anne des Monts River, Gaspé Co., Que.; on rocks, vicinity of Ottawa, Ont.; and on trees and rocks, Lake Nipigon; on rocks, Otter Slide Creek, Algonquin Park, Ont., July, 1900; on old logs, Hector, Rocky Mountains; on earth and rocks at Revelstoke, B.C.; and at Deer Park, Lower Arrow Lake, Columbia River, B.C. (*Macoun.*)

120. **N. lævigatum,** Ach.

On mossy rocks and on tree trunks.

East Ste. Modeste, Labrador; on rocks, Leading Tickle, Newfoundland. (*Waghorne.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On earth and sand, east end of Sable Island, N.S., Aug. 8, 1899; on rocks in a ravine, Big Intervale, and at McNeill's Harbour, and on trunks at Baddeck, Cape Breton Island, N.S., 1898; on trees, Jupiter River, Anticosti; on rocks, Cape Rosier, Gaspé Co., Que.; not uncommon on boulders around Ottawa, Ont.; on rocks, King's Mountain, near Chelsea, Que.; on boulders in woods at Belleville and Brighton, Ont.; on rocks and trunks, Algonquin Park, Ont., July, 1900; on rocks, Roger's Pass, Selkirk Mountains, B.C.; on rocks and earth, Bragg's Creek, and Moose Mountain, Rocky Mountains, alt. 6,000 feet; on rocks at Victoria and on Mount Benson, Vancouver Island. (*Macoun.*)

Var. **parile,** Nyl.

Forteau, Labrador. (*Waghorne.*) On rocks at Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On rocks, Big Intervale, Margaree and McNeill's Harbour, Cape Breton Island, N.S., Aug. 4,

1898 ; on boulders along Jupiter River, Anticosti ; on boulders at King's Mountain, near Chelsea, Que.; on rocks, Catfish Lake, Algonquin Park, Ont., July, 1900 ; on rocks at Thunder Bay, Lake Superior and along Lake Nipigon ; on rocks at Deer Park and Pass Creek, Columbia River ; on rocks at Sicamous, B.C.; on rocks, Moose Mountain, alt. 6,000 feet, Rocky Mountains. (*Macoun.*)

121. **N. Lusitanicum,** SCHÆR.

On rocks, trees and bushes.

On rocks, Notre Dame Bay, Newfoundland. (*Waghorne.*) On rotten wood at Revelstoke, Columbia River, B.C.; on rocks by the sea, Victoria Arm and Cadboro Bay, Victo ia, and in same situation at Qualicum and Comox, Vancouver Island. (*Macoun.*)

15. PELTIGERA, (Willd.) Fée.

122 **P. venosa,** (LINN.) HOFFM.

On damp earth by roadsides, rivers, lakes and brooks.

Greenland. (*Vahl.*) Forteau, Labrador. (*Waghorne.*) On earth, Ste. Anne des Monts River, Gaspé Co., Que.; along the Lièvre River above the falls at Buckingham, Que.; Gull River, at the head of Moore's Lake, Victoria Co., Ont.; five miles up the Kaministiquia River, Lake Superior ; on earth along Jumping Pound Creek, Rocky Mountains ; at Quesnel, Fraser River, B.C.; in Albert Cañon, Selkirk Mountains, B.C.; Hastings, Burrard Inlet, B.C.; by roadsides at Victoria, Vancouver Island. (*Macoun.*) Northwest coas'. (*Menzies.*) Behring Strait. (*Wright.*)

123. **P. aphthosa,** (LINN.) HOFFM.

On rocks amongst mosses, on old logs and earth.

Greenland. (*Arct. Man.*) Throughout Arctic America. (*Richardson.*) Fort Chimo and Clearwater Lake, Labrador. (*A. P. Low.*) On rocks, Eagle River, Newfoundland. (*Waghorne.*) At Fort Norman, Mackenzie River. (*Miss E. Taylor.*) Along the Tobique River, N.B. (*G. U. Hay.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) In woods along the Rouge River, Argenteuil Co., Que. (*D'Urban.*) Sides of hummocks in swamps, Edmonton, Ont. (*James White.*) Rotten logs, Morton's swamp, Brampton, Ont. (*Thos. Walker.*) Shores of Lake Supe-

rior. (*Agassiz.*) Quite common at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898; on earth at Truro, N.S.; on the bases of trees, Jupiter River, Anticosti; on earth along the Gaspé coast; on earth at Ottawa, Ont.; on logs at Carleton Place, Ont.; on earth at Belleville, Ont.; on a decaying log at Guelph, Ont.; common in Algonquin Park, Ont., 1900; on mossy rocks, Rideau River, Lake Superior; in mossy woods, Lake Nipigon; on earth in woods, Duck Mountain, Man.; on earth along Jumping Pound Creek, Rocky Mountains; on old logs, Revelstoke, B.C.; on rocks, North Arm, Burrard Inlet, B.C.; on rocks, Burnside Road, Victoria, Vancouver Island. (*Macoun.*) Mossy rocks, Lake Winnipeg; Chilliwack Valley, B.C.; St. Paul Island, Behring Sea; and Port Etches, Alaska. (*J. M. Macoun.*) Mountains east of Adam's Lake, B.C., alt. 3,300 feet, (*Dr. G. M. Dawson.*)

124. **P. horizontalis,** (Linn.) Hoffm.

On mossy rocks, Tobique River, N.B. (*G. U. Hay.*) On rocks in woods, Margaree, Cape Breton Island, N.S., July, 1898; on rocks, Ste. Anne des Monts River, Gaspé Co., Que.; on rocks and logs at Ottawa and Carleton Place, Ont.; at Shannonville, Hastings Co., Ont.; on old logs, Algonquin Park, Ont., June, 1900; on rocks near Otter Head, Lake Superior, and on rocks, Lake Nipigon, Ont.; on rocks, shore of Kootenay Lake, B.C.; on rocks and earth in woods at Revelstoke, B.C.; on old logs, Roger's Pass, Selkirk Mountains, B.C. (*Macoun.*) Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*) Moist rocks amongst mosses, shores of Behring Strait. (*Wright.*)

125. **P. polydactyla,** Neck.) Hoffm.

On rocks and trunks amongst mosses.

Greenland. (*Branth.*) L'Anse au Mort, Labrador; Bay of Islands, Newfoundland. (*Waghorne.*) Moist rocks, Tobique River, N.B. (*G. U. Hay.*) On logs in woods, Rivière Rouge, Argenteuil Co., Que. (*D'Urban.*) On ground at Edmonton, Ont., (*James White.*) On boulders in woods at Baddeck, Cape Breton Island, N.S., July, 1898; in woods, Gaspé Co., Que.; on rocks, Algonquin Park, Ont., June, 1900; on old logs, Albert Cañon, Selkirk Mountains, B.C.; on rocks at Hector, Rocky Mountains;

on old logs at Hastings, Burrard Inlet, B.C.; on earth at Comox, Vancouver Island. (*Macoun.*) Crow's Nest Pass, Rocky Mountains. (*Dr. G M. Dawson.*)

126. **P. scutata,** (DICKS.) LEIGHT.

On earth, rocks and trees, among mosses.

British Columbia. (*Dr. Lyall.*) On earth at Yale, Fraser River, B.C.; at Victoria and Comox, Vancouver Island. (*Macoun.*) Harbledown Island, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*) Behring Island, Behring Sea. (*J. M. Macoun.*)

127. **P. pulverulenta,** (TAYL.) NYL.

Greenland. (*Brentel.*) Clearwater Lake, Labrador, July, 1896. (*A. P. Low.*) Capstan Island and L'Anse au Clair, Labrador. (*Waghorne.*) On rocks, Smoky Mountain, Cape Breton Island, N.S., Aug. 3rd, 1898 ; on rocks, Algonquin Park, Ont., June, 1900. (*Macoun.*) Mouth of Skeena River, B.C.; Port Etches and Prince of Wales Island, Alaska. (*J. M. Macoun.*) On rocks, Kotzebue Sound, Alaska. (*Herb. Babington.*)

128. **P. malacea,** (ACH.) FR.

On earth, Greenland. (*Branth.*) Bay Bull's Arm and Middle Arm, Newfoundland. (*Waghorne.*) On earth at Tadousac, Que. (*A. T. Drummond.*)

129. **P. rufescens,** (NECK.) HOFFM.

On earth, rocks and trunks, among mosses.

Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) On earth, Forteau and Red Bay, Labrador. (*Waghorne.*) On the ground and on mossy hummocks, Edmonton and Credit Forks, Ont. (*James White.*) On rocks in woods, Margaree, Cape Breton Island, N.S., July 16th, 1898 ; on earth at Truro, N.S.; on earth, rocks and trees at Ottawa, Ont.; on rocks, Lake Nipigon ; on earth, Thunder Bay, Lake Superior ; on earth, Manitoba House, Lake Manitoba, Man.; on earth in woods at Revelstoke, B.C.; on earth at Hector, Rocky Mountains, B.C.; at Quesnel, B.C.; and on rocks, Burnside Road, Victoria, Vancouver Island. (*Macoun.*)

130. **P. canina,** (LINN.) HOFFM.

On earth, rocks and mossy trunks.

Greenland. (*Branth.*) Arctic America. (*Richardson.*) Canada. (*Agassiz.*) Digge's Island and Mansfield Island, Hudson Strait. (*Dr. R. Bell.*) On earth, Forteau, Labrador ; also Birchy Cove, Newfoundland. (*Waghorne.*) Drury's Cove, St. John's and Tobique rivers, N.B. (*G. U. Hay.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On a dead log near Kingston, Ont. (*Thos. Walker.*) On sandy earth, east end of Sable Island, N.S., Aug. 8th, 1899 ; quite common at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898 ; roots of trees, Jupiter River, Anticosti ; on rocks near Meech's Lake, near Chelsea, Que.; common at Ottawa, Ont.; on logs in woods, Carleton Place, Ont.; on earth in woods, Belleville, Hastings Co., Ont.; on earth in woods, Jordan Station, Lincoln Co., and Pelee Point, Essex Co., May, 1901 ; on old logs, Algonquin Park, Ont., June, 1900 ; on earth, Lake Nipigon, Ont. ; on earth and logs at Jumping Pound Creek and Crow's Nest Pass, Rocky Mountains ; on earth in woods at Revelstoke and Donald, B.C.; on rocks and trees, Burnside Road, Victoria, Vancouver Island. (*Macoun.*) Deceit Bay, B.C., and Comox, Vancouver Island. (*Dr. G. M. Dawson.*) Kadiak Island, Alaska ; St. Paul Island and Unalaska, Behring Sea. (*J. M. Macoun.*)

Var. **spongiosa,** TUCKERM.

On earth, Eagle River, Newfoundland. (*Waghorne.*) On earth, Algonquin Park, Ont., June, 1900 ; on mossy logs along the Fraser River at Yale, B.C., 1872. (*Macoun.*) Middleton Island, Alaska, Lat. 59° 30′ ; St. Paul Island, St. George Island and Unalaska, Behring Sea. (*J. M. Macoun.*)

Var. **membranacea,** ACH.

Northwest coast. (*Douglas.*) Carmanah, near Cape Beale, Vancouver Island ; and at Port Etches, Alaska, 1892. (*J. M. Macoun.*)

Var. **spuria,** ACH.

Meadows in the Bay of Islands, Newfoundland. (*Waghorne.*) Clearwater Lake, Labrador, July, 1896. (*A. P. Low.*) In a dense

tuft of moss which it divided, St. Paul Island, Behring Sea, June, 1897. (*J. M. Macoun.*) On earth, near Victoria, Vancouver Island, May, 1875. (*Macoun.*)

Var. **sorediata,** SCHÆR.

Clode Sound, Newfoundland. (*Waghorne.*) On earth along the Tobique River, N.B. (*G. U. Hay.*) On banks of islands in Behring Strait. (*Wright.*)

16. SOLORINA, Ach.

131. **S. crocea,** (LINN,) ACH.

On earth in alpine districts.

Greenland. (*Branth.*) West Greenland. (*Rosenvinge.*) On earth, King George's Sound Baffin Bay, 1897 ; Cape Chudleigh, Hudson Strait. (*Dr. R. Bell.*) Labrador. (*Wenck.*) Venison Tickle, Labrador. (*Waghorne.*) North of Point Lake, Barren Grounds. (*Richardson.*) On earth at Banff, on Moose Mountain, Elbow River, at Lake Agnes, and on rocks, summit of mountain, north of Kicking Horse Lake, Rocky Mountains ; on earth, mountains north of Griffin Lake, Gold Range, B.C.; on earth, Sky Line mine, Kootenay Lake, B.C.; on rocks, summit of Mount Benson, Nanaimo, Vancouver Island. (*Macoun.*) St. Paul Island, Behring Sea. (*J. M. Macoun.*) Shores of Behring Strait. (*Wright.*)

132. **S. saccata,** (LINN.) ACH.

On earth, especially in calcareous regions.

Greenland. (*Vahl.*) L'Anse au Clair, Labrador ; Benoit's Cove and John's Beach, Newfoundland. (*Waghorne.*) Newfoundland. (*Pylaie.*) Great Bear Lake. (*Herb. Hooker.*) On earth, Tobique River, N.B. (*G. U. Hay.*) Ste. Anne des Monts River, Gaspé Co., Que.; crevices of limestone rocks, Rockcliffe Park, Ottawa, Ont.; on limestone rocks, Heeley's Falls, Northumberland Co., Ont.; on rocks at Michipicoten, east side of Lake Superior, and on earth, Lake Nipigon ; on earth at Morley, Jumping Pound Creek, and at Hector, both by the torrent and high up on the mountain, Rocky Mountains ; on House Mountain, near Little Slave Lake, Atha. (*Macoun.*) Along Clearwater River, above

Fort McMurray, Atha. (*J. M. Macoun.*) Shores of Behring Strait. (*Wright.*)

Var. **spongiosa,** NYL.

Arctic America and Gréenland. (*Tuckerman.*) Newfoundland. (*Nylander.*) On earth in crevices of limestone rocks, Gunn River, Anticosti, Aug. 29th, 1883; on earth, Moose Mountain, alt. 7,000 feet, Rocky Mountains, July 2nd, 1897. (*Macoun.*) Islands at Behring Strait. (*Wright.*)

17. PHYSMA, Mass.

133. **P. luridum,** (MONT.) TUCKERM.

A single specimen collected in Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

18. PANNARIA, Delis.

134. **P. lanuginosa,** (ACH.) KŒRB.

On shaded perpendicular rocks.

Canada. (*Drummond.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On limestone rocks in ravines at Margaree, Cape Breton Island, N.S., July, 1898; on limestone rocks west of Hull, Que.; under ledges in woods near Experimental Farm, Ottawa, Ont.; on rocks, Algonquin Park, Ont., June, 1900. (*Macoun.*) On Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On rocks, Kingston Mills, Ont., 1901. (*J. M. Macoun.*) On sandstone rocks, Credit Forks, Ont. (*Thos. Walker.*)

135. **P. hypnorum,** (HOFFM.) KŒRB.

On the earth growing over mosses and twigs in alpine districts.

Greenland. (*Branth.*) Arctic America. (*Richardson.*) Newfoundland. (*Despreaux.*) Venison Tickle, Labrador; Half-Way Point, Newfoundland. (*Waghorne.*) On earth, South West Point, Anticosti; on earth in woods at Banff and on the summit of Sulphur Mountain, at Hector, on Moose Mountain and in the Crow's Nest Pass, Rocky Mountains; on earth in Roger's Pass, Selkirk Mountains, B.C.; on rocks, Cedar Hill, near Victoria, and on rocks, Mount Benson, Nanaimo, Vancouver Island. (*Macoun.*) On earth, Unalaska, Behring Sea. (*J. M. Macoun.*)

136. **P. rubiginosa,** (THUNB.) DELIS.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On trees, Ste. Anne des Monts River, Gaspé Co., Que. August 18th, 1882. (*Macoun.*)

Var. **conoplea,** FR.

On rocks at Truro, N.S., June, 1883 ; on the bases of trees, North Bay, Lake Nipissing, May, 1884. (*Macoun.*)

137. **P. leucosticta,** TUCKERM.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On trees at Madaline River and on rocks, Ste. Anne des Monts River, Gaspé Co., Que.; on boulders in McKay's woods, Ottawa, Ont. ; on rocks in Roger's Pass, Selkirk Mountains, B.C. (*Macoun.*)

138. **P. Hookeri,** (SM.) TH. FR.

On rocks, Greenland. (*Vahl.*)

139. **P. brunnea,** (SW.) MASS

Greenland. (*Vahl.*) On earth, Arctic America. (*Richardson.*) On earth, Seal Lake, Labrador. (*A. P. Low.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On earth at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898; on earth, Jupiter River, Anticosti ; on earth near Cape Rosier, Gaspé Peninsula, Que.; on earth, summit of Mount Albert, Gaspé Co., Que. ; on earth, Tunnel Mountain, Banff, Rocky Mountains, 1891; on earth and logs at Hector, and on Moose Mountain, Elbow River, and in Crow's Nest Pass, Rocky Mountains ; on earth, Albert Cañon, Selkirk Mountains, B.C. ; on earth at Hastings, Burrard Inlet, B.C. (*Macoun.*) Islands of Behring Sea. (*Wright.*)

140. **P. microphylla,** (SW.) DELIS.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On rocks, Greenland. (*Branth.*) On earth, Salt Lake, Anticosti ; on damp rocks, Meech's Lake and on King's Mountain, near Chelsea, Que. ; on rocks, Lake Nipigon, Ont. ; also on stones at Ottawa, Ont.

141. **P. lepidiota,** Th. Fr.

On earth and rocks, Greenland. (*Vahl.*) Rope Cove, in the Bay of Islands, Newfoundland. (*Waghorne.*) On rocks, Half-Way Creek, and on trunks at Margaree, Cape Breton Island, N.S., 1898; on earth, Salt Lake, Anticosti; on rocks, north shore of Lake Superior, and on the bases of trees, Lake Nipigon; on earth along Jumping Pound Creek, and on Mount Forget-me-not, Elbow River, Rocky Mountains, alt. 6,500 feet, 1897; on rocks by the sea, Craigflower, near Victoria, Vancouver Island. (*Macoun.*)

Var. **coralliphora,** Tuckerm.

On rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C.; on rocks near Victoria, Vancouver Island. (*Macoun.*)

142. **P. carnosa,** (Dicks.) Tuckerm.

On rocks among mosses.

Great Bear Lake, Arctic America. (*Richardson.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

143. **P. tryptophylla,** (Ach.) Mass.

On trunks of trees and stones.

On bark, Greenland. (*Branth.*) Rope Cove, Lark Harbour, Wild Cove and Shoal Point, Newfoundland. (*Waghorne.*) On dead wood, Gaspé Co., Que.; Mount Erskine, Salt Spring Island, Gulf of Georgia, B.C. (*Macoun.*)

144. **P. Waghornei,** Eckfeldt, Bull. Torr. Bot. Club, Vol. XXII., 246, 1895.

On turfy earth. Evidently a well marked species and not closely related to any other. Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

145. **P. plumbea,** (Lightf.) Delis.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On a birch stump and on exposed rocks, Grand Manan, N.B. (*Willey.*)

146. **P. nigra,** (Huds.) Nyl.

On calcareous rocks, Ste. Anne des Monts River, Gaspé Co., Que.; on limestone rocks, Rockcliffe Park and many other places

around Ottawa, Ont. (*Macoun.* On rocks, Tadousac, Que. (*A. T. Drummond.*)

147. **P. Macounii,** TUCKERM. MS.

On calcareous rocks, Jupiter River Anticosti, Que., Aug. 23rd, 1883. (*Macoun.*)

19. EPHEBE, Fr., Born.

148. **E. pubescens,** FR.

On rocks, Greenland. (*Branth.*) On rocks, summit of Mount Benson, near Nanaimo, Vancouver Island, June 8, 1887. (*Macoun.*)

20. OMPHALARIA, Dur. & Mont.

149. **O. phyllisca,** (WAHL.) TUCKERM.

Granite rocks, north shore of Lake Superior. (*Agassiz.*)

21. COLLEMA, Hoffm.

150. **C. myriococcum,** ACH.

On moss on rocks in a ravine at Margaree, Cape Breton Island, N.S., July, 1898 ; growing over mosses on limestone rocks, Rockcliffe Park, Ottawa, Ont.; on perpendicular cliffs, King's Mountain, near Chelsea, Que., 1897 ; at Lake Nipigon, Ont. (*Macoun.*)

151. **C. pycnocarpum,** NYL.

On trunks, Durham, Que. (*A. T. Drummond.*) On trunks in woods, Brighton, Northumberland Co., Ont., 1893. (*Macoun.*)

152. **C. cyrtaspis,** TUCKERM.

On earth at Revelstoke, B.C., May 5th, 1890 ; on earth, Spence's Bridge, B.C., May 30th, 1889. (*Macoun.*)

153. **C. leptaleum,** TUCKERM.

On trees at Truro, N.S., June, 1883 ; on ash trees in a swamp at Baddeck, Cape Breton Island, N.S., July, 1898. (*Macoun.*)

154. **C. flaccidum,** Ach.

On rocks and trunks. Greenland. (*Branth.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On trunks, Tadousac, Que. (*A. T. Drummond.*) On spruce trees, Salt Lake, Anticosti; on earth Gaspé Basin, and along Ste. Anne des Monts River, Gaspé Co., Que.; on trees, Sudbury Junction and on rocks, Lake Nipigon, Ont.; on trunks in woods, Seymour West, Northumberland Co., Ont.; on rocks at Morley, Rocky Mountains; on trees at Revelstoke, Columbia River, B.C.; on rocks at Spence's Bridge and Agassiz, B.C.; on bark of trees, Burnside Road, Victoria, Vancouver Island. (*Macoun.*)

155. **C. nigrescens,** (Huds.) Ach.

On trees. Greenland. (*Lindsay.*) On bark of ash trees, Ste. Anne des Monts River, Gaspé Co., Que.; on ash trees in a swamp at Baddeck, Cape Breton Island, N.S., July, 1898; on trees in Algonquin Park, Ont., June, 1900; on trees at Sudbury Junction, Ont.; ash trees, Blackwater River, Lake Nipigon, Ont.; on rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C., June 8th, 1890. (*Macoun.*)

156. **C. pulposum,** (Bernh.) Nyl.

On earth, Greenland. (*Branth.*) On earth at Tadousac, Que. (*A. T. Drummond.*) On earth, Ste. Anne des Monts River, Gaspé Co., Que.; on limestone rocks, Rockcliffe Park, Ottawa, Ont.; on earth at Belleville, Hastings Co., Ont.; on the bases of trees, Seymour, Northumberland Co., Ont.; on calcareous earth along Old Wives' Creek, Assa., 1895; on earth, Kananaskis Falls and Jumping Pound Creek, Rocky Mountains; on earth at Revelstoke, Columbia River, B.C.; Telegraph Trail, west of Quesnel, B.C.; on earth at Victoria, Vancouver Island. (*Macoun.*) Cape Lisburne, Alaska. *Rothrock.*)

157. **C. tenax,** (Sw.) Ach.

On earth in calcareous soils.

On earth west of Hull, Que., and in Rockcliffe Park, Ottawa, Ont.; on limestone rocks along the Moira River at Belleville, Ont.; on rocks at Port Arthur, shore of Lake Superior; on earth, Cypress Hills, Assa.; on earth at Otterburne, Manitoba. (*Macoun.*)

158. **C. crispum,** Borr.

On earth, Canada. (*A. T. Drummond.*) On calcareous earth, west of Hull and on King's Mountain near Chelsea, Que. ; on earth at Quesnel, B.C., June, 1875. (*Macoun.*)

159. **C. limosum,** Ach.

On calcareous earth in a cutting west of Hull, Que.; very rare; on earth in wet soil at Morley, Rocky Mountains ; on earth on wet rocks near Victoria, Vancouver Island. (*Macoun.*)

160. **C. melænum,** Ach.

Calcareous and other rocks.
Greenland. (*Vahl.*) Labrador or Newfoundland. (*Waghorne fide Eckfeldt.*) On rocks, Lake Nipigon, Ont., July 9th, 1884. Named by Tuckerman. (*Macoun.*)

Var. **polycarpum,** Schaer.

Islands of Behring Strait. (*Wright.*)

161. **C. multipartitum,** (Sm.) Tayl.

On calcareous rocks near Stewart's Lake, northern British Columbia, June 25th, 1875. (*Macoun.*)

162. **C. furvum,** (Ach.) Nyl.

On calcareous rocks.
L'Anse au Mort, Labrador. (*Waghorne.*) On rocks, Tadousac, Que. (*A. T. Drummond.*) Along the shores of Lake Nipigon, Ont.; on stones, Cypress Hills, Assa ; found also in Canada by Tuckerman. (*Macoun.*)

163. **C. pustulatum,** Ach.

Calcareous rocks, Rocky Mountains, Lat. 54°-56°. (*Drummond.*) On calcareous rocks along Jumping Pound Creek, Rocky Mountains, June, 1897 ; on bark of trees, Burnside Road, near Victoria, Vancouver Island, May 10th, 1893. (*Macoun.*)

164. **C. floculosa,** Nyl.

On limestone rocks below Governor's Bay, Rockcliffe Park, Ottawa, Ont.; on naked limestone rocks in woods south of the Aylmer Electric Railway, west of Hull, Que.; very rare, May 16th, 1896. (*Macoun.*)

22. LEPTOGIUM, Fr., Nyl.

165. **L. muscicola,** (Sw.) Fr.

Growing over mosses on rocks on mountains.

On rocks, Tunnel Mountain, Banff, and on mosses, Mt. Forget-me-not, Rocky Mountains; on rocks by the Fraser River at Yale B.C.; on rocks along the Burnside Road, Victoria, Vancouver Island. (*Macoun.*) Islands in Behring Strait. (*Wright.*)

166. **L. albociliatum,** Desmaz.

Among mosses on rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C., June 6th, 1890. (*Macoun.*)

167. **L. tenuissimum,** (Dicks.) Kœrb.

On sandy banks among mosses.

On old rails along the Richmond Road, Ottawa, Ont., April, 1896; on earth among mosses, northern British Columbia, June, 1875. (*Macoun.*) Islands of Behring Strait. (*Wright.*)

168. **L. minutissimum,** (Flœrk) Mass.

On moss on rocks, summit of Mount Benson, Nanaimo, Vancouver Island, July, 1893, alt. 3,000 ft. (*Macoun.*)

169. **L. lacerum,** (Sw.) Fr.

Among mosses on rocks.

Greenland. (*Branth.*) On rocks, Canada. (*A. T. Drummond.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Along Ste. Anne des Monts River, Gaspé Co., Que.; on limestone rocks Rockcliffe, Ottawa, Ont.; on rocks along the Moira at Belleville, Hastings Co., Ont.; on rocks, Lake Nipigon, and at Thunder Bay, Lake Superior; on rocks at Hector, Rocky Mountains; at Deer

Park, Lower Arrow Lake, Columbia River, B.C.; on rocks, at Yale, Fraser River, B.C.; at Lytton and Hastings, B.C. (*Macoun.*) On rocks at London, Ont. (*J. Dearness.*)

170. **L. Californicum,** Tuckerm.

On rocks among mosses and on the bark of oak trees, Burnside Road, near Victoria, and on rocks, Parson's Mountain, Vancouver Island; on rocks, Mount Erskine Salt Spring Island, Gulf of Georgia, B.C. May 9th 1887. (*Macoun.*)

171. **L. palmatum,** (Huds.) Mont.

On earth and rocks among mosses.

On rocks, Six-mile Creek, Selkirk Mountains, and on rocks at Sicamous, B.C.; on rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C.; on rocks at Donald, Columbia River, B.C.; on rocks at Yale and Moodyville, and near high-water mark on rocks, North Arm, Burrard Inlet, B.C.; on rocks, Burnside Road, Victoria, and at Comox, Vancouver Island. (*Macoun.*) Forward Island, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*) British Columbia. (*Lyall.*)

172. **L. pulchellum,** (Ach.) Nyl.

On tree-trunks and rocks.

On trees at Beechwood, Ottawa, Ont., and on trees in woods at Belleville, Hastings Co., Ont.; on tree-trunks in woods, Seymour West, Northumberland Co., Ont.; on trees, Burnside Road, Victoria, Vancouver Island, 1893. (*Macoun.*)

173. **L. Tremelloides,** (Linn. f.) Fr.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On rocks and trunks in swamps, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On trunks and on old logs at Baddeck, Margaree, and Smoky Mountain, Cape Breton Island, N.S., July, 1898; on rocks and trees at Truro, N.S.; on trees along Ste. Anne des Monts River, Gaspé Co., Que.; on trees and rocks, Rockcliffe and Beechwood, Ottawa Ont.; on trees and rocks at Belleville, Hastings Co., and on Gibson's Mountain, Prince Edward Co., Ont.; on rocks, Algonquin Park, Ont., June, 1900; on rocks near Otter Head, east coast of Lake Superior; on stones, Roger's

Pass, Selkirk Mountains, B.C. (*Macoun.*) Portage between South Fowl Lake and Pigeon River, Ont. (*Fink.*) Salmon Creek, Juneau, Alaska. (*Miss G. Cooley.*)

174. **L. dactylinum,** Tuckerm.

On rocks by the sea at Craigflower, near Victoria, Vancouver Island, May 30th, 1893. (*Macoun.*)

175. **L. chloromelum,** (Sw.) Nyl.

On trunks of trees and on rocks.

On bark, Wild Cove, Newfoundland. (*Waghorne.*) At Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On rocks, Tobique River, N.B. (*G. U. Hay.*) Canada. (*A. T. Drummond.*) On trunks at Baddeck, Cape Breton Island, N.S., July, 1898; on trunks, Central Ontario Junction, Hastings Co., Ont.; on rocks, Lake Nipigon, Ont.; on trunks, Seymour West, Northumberland Co., Ont.; on old rails at Aylmer, Que., and on rocks, King's Mountain, near Chelsea, Que.; on black ash trunks, Algonquin Park, Ont., June, 1900. (*Macoun.*)

176. **L. intermedium,** Arnold.

On birch bark, Middle Arm, Newfoundland. (*Waghorne.*)

177. **L. myochroum,** (Ehrh.) Tuckerm.

On trees and rocks.

Greenland. (*Branth.*) Great Bear Lake, Arctic America. (*Richardson.*) On rocks, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On rocks and trees at Ottawa, Ont.; on rocks and trees at Shannonville, Hastings Co., Ont.; on trees at Brighton and Seymour West, Northumberland Co., Ont.; on trees, Algonquin Park, Ont., June, 1900; Thunder Bay, Lake Superior; on rocks, Crow's Nest Pass, alt. 4,000 feet; on balsam poplar trunks along Jumping Pound Creek, and on rocks, Mount Forget-me-not, alt. 6,000 feet, Rocky Mountains; at Yale, Fraser River, B.C.; on rocks along the Burnside Road, near Victoria, Vancouver Island. (*Macoun.*)

178. **L. respulinum,** Ach.

On limestone rocks at Rockliffe Park, Ottawa, Ont., April 16th, 1891. (*Macoun.*)

23. PLACODIUM, (DC.) Naeg. & Hepp.

179. **P. elegans,** (Link.) DC.

On rocks.

Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) Melville Island. (*R. Brown.*) Nottingham Island, Hudson Strait. (*Dr. R. Bell.*) On rocks, Fort Chimo, Ungava Bay, Labrador, Aug., 1896. (*A. P. Low.*) Newfoundland. (*Pylaie.*) St. John, N.B. (*J. Mosey.*) Southwest Point, Anticosti, Que.; falls of the Madeline River, Gaspé Co., Que.; on a large boulder, Governor's Bay, Rockliffe Park, Ottawa, Ont.; abundant around Lake Nipigon and Lake Superior; on rocks, Cypress Hills, Assa., and at the "elbow" of the South Saskatchewan, Assa.; in woods at Banff and along Jumping Pound Creek, Rocky Mountains; at Deer Park, Lower Arrow Lake, Columbia River, B.C.; Mount Benson, near Nanaimo, Vancouver Island. (*Macoun.*) Buffalo Lake, Lat. 56°, north of Ile à la Crosse, Atha. (*J. M. Macoun.*) Harbledown Island, Gulf of Georgia, B.C, (*Dr. G. M. Dawson.*) Islands of Behring Strait. (*Wright.*) Alaska. (*Turner.*)

Var. **trachyphyllum,** Tuckerm.

On boulders in the Cypress Hills, Assa., June 10th, 1884. (*J. M. Macoun.*)

180. **P. murorum,** (Hoffm.) DC.

On rocks, Greenland. (*Arct. Man.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On rocks, Arctic America. (*Richardson.*) On sandstone rocks, "elbow" of South Saskatchewan, Assa., July 18th, 1879; abundant on sandstone rocks, Wood Mountain, Assa., June 10th, 1895. (*Macoun.*)

181. **P. fulgens,** (Sw.) DC.

On calcareous soils, Greenland. (*Vahl.*) On earth along Old Wives' Creek, Assa., May 23rd, 1895. (*Macoun.*)

182. **P. cirrochroum,** (Ach.) Hepp.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

183. **P. aurantiacum,** (Lightf.) Naeg. & Hepp.

On dead wood, trees and rocks,

Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On driftwood, Gunn River, Anticosti, Que.; on bark of trees, Truro, N.S.; on rocks and trees, not rare, around Ottawa, Ont.; on bark of trees, Lake Nipigon, Ont.; on *Alnus rubra*, along the sea at Comox, Vancouver Island. (*Macoun.*) On driftwood, Blankensop Bay, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*)

184. **P. rupestre,** (Scop.) Br. & Rostr.

On calcareous rocks, St. Anne des Monts River, Gaspé Co., Que., Aug. 17th, 1882. (*Macoun.*)

185. **P. cerinum,** (Hedw.) Naeg. & Hepp.

Common on trees, dead wood and mosses.

Greenland. (*Arct. Man.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On trunks, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) Arctic America. (*Richardson.*) On bark of various trees at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898; on birch bark, Algonquin Park, Ont., June, 1900; on bark of aspen poplar at Belleville, Hastings Co., Ont.; along Nipigon River, Ont.; on the Porcupine Hills, Man., and in the Moose Mountains, Assa.; along Red Deer River, Man.; Athabasca River, Lat. 55°; on moss on rocks at Lytton, B.C.; on bark of maples at Hastings, Burrard Inlet, B C.; on bark at Comox, Vancouver Island. (*Macoun.*)

Var. **pyracea,** Nyl.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On old cedar trunks in Dow's swamp, Ottawa, Ont., May 2nd, 1896; on bark of small maples at Hastings, British Columbia, April, 1889. (*Macoun.*) On bark, Nagai Island, Shumigan Group, Alaska, Sept. 18th, 1892. (*J. M. Macoun.*) Icy Cape, Arctic Ocean, Alaska. (*Rothrock.*)

Var. **pyracea,** Nyl. forma, **ulmicola,** DC.
Caloplaca pyracea, f. ulmicola, DC.

Very abundant on dead *Negundo aceroides* on the banks of Old Wives' Creek, near Old Wives' Lake, Assa., and at the forks of the creek, June 2nd, 1895. (*Macoun.*)

186. **P. Jungermanniæ,** (VAHL) TUCKERM.

On earth and upon mosses.

Greenland. (*Vahl.*) Arctic America, Great Bear Lake. (*Richardson.*) On earth in Bow River Pass at Banff, and on Castle Mountain, Rocky Mountains ; on moss along Bragg's Creek and on Moose Mountain, Rocky Mountains ; on earth, Telegraph Trail, B.C. (*Macoun.*) On earth Unalaska Island, Behring Sea, Aug., 1891. (*J. M. Macoun.*) Islands of Behring Strait. (*Wright.*)

187. **P. nivale,** (KŒRB.) TUCKERM.

On mosses, Greenland. (*Brentel.*)

188. **P. sinapispermum,** (AUCT.) HEPP.

On mosses in arctic and alpine regions.

Greenland. (*Vahl.*) On earth, Clearwater Lake, Labrador, 1896. (*A. P. Low.*) On earth along Jumping Pound Creek, Rocky Mountains, June, 1897 ; on earth in the Bow River Pass, Rocky Mountains ; along the Telegraph Trail, Blackwater River, B.C. (*Macoun.*) Islands of Behring Strait. (*Wright.*)

189. **P. tetraspora,** (NYL.)

On earth in Greenland. (*Branth.*) On earth, Moose Mountain, Rocky Mountains, alt. 6,500 feet, July 3rd, 1897. (*Macoun.*)

190. **P. ferrugineum,** (HUDS.) HEPP.

On dead wood, rocks and mosses.

Greenland. (*Vahl.*) In Alaska. (*Dr. Kellogg.*) On bark of black ash trees in a swamp at Baddeck, Cape Breton Island, N.S., July, 1898 ; on earth and rocks at Banff, Rocky Mountains ; on earth at Hector, Rocky Mountains ; on poplar bark, Sea's farm, near Victoria, Vancouver Island. (*Macoun.*) On earth, St. Paul Island and Unalaska Island, Behring Sea. (*J. M. Macoun.*) Port Clarence, Alaska, and elsewhere ; not rare. (*Rothrock.*)

Var. **discolor,** WILLEY.

On ash bark at the mouth of the Madeline River, Gaspé Co., Aug. 5th, 1882 ; on black ash bark at Baddeck, Cape Breton Island, N.S., July 9th, 1898. (*Macoun.*)

191. **P. crenulatum,** (WAHLENB.) TUCKERM.

Maritime rocks, Greenland. (*Vahl.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Sitka, Alaska. (*Rothrock.*)

192. **P. variabile,** (PERS.) NYL.

Port Clarence, Alaska. (*Rothrock.*)

193. **P. vitellinum,** (EHRH.) NAEG. & HEPP.

On dead wood and rocks.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Greenland. (*Arct. Man.*) At Fort Franklin, Arctic America. (*Richardson.*) North Bluff, Hudson Strait. (*Dr. R. Bell.*) On rocks, Ste. Anne des Monts River, Gaspé Co., Que., Aug. 19th, 1882; on old rails, in great profusion, Brighton, Ont., common on old rails and boulders around Ottawa, Ont.; and on boulders at Aylmer, Que., 1900. (*Macoun.*) Behring Strait. (*Wright.*) Port Clarence, Alaska. (*Rothrock.*)

Var. **aurellum,** ACH.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On rocks, Canada. (*A. T. Drummond.*) On rocks, Ste. Anne des Monts River, Gaspé Co., Que., Aug. 19th, 1882; on boulders around Ottawa, Ont., not rare. (*Macoun.*)

Var. **octosporum,** NYL.

On earth, north shore of Hudson Strait, Aug., 1897. (*Dr. R. Bell.*) On rocks near Hogsback, Ottawa, Ont., May 2nd, 1895, and on bark of cedar rails near Ottawa, Ont., April 14th, 1897. (*Macoun.*)

24. LECANORA, Ach.

194. **L. lentigera,** (WEB.) ACH.

On earth along the Elbow River, below the Fisher branch, Rocky Mountains, July 12th, 1897; on earth at Morley, Bow River Pass, Rocky Mountains, June, 1885. (*Macoun.*)

195. **L. gelida,** (LINN.) ACH.

On rocks, Greenland. (*Vahl.*) On boulders near Stewart's Lake, northern British Columbia, June, 1875. (*Macoun.*) Cher-

nofski Island, Unalaska and Belkofski, Aliaska Peninsula. (*Rothrock.*)

196. **L. rubina,** (VILL.) ACH.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Greenland. (*Arct. Man.*) On rocks, Arctic America. (*Richardson.*) Shores of Lake Superior. (*Agassiz.*) On rocks above Michipicoten, Lake Superior ; on rocks, Lake Nipigon, Ont.; on boulders along the Milk River, Alberta ; on boulders along Jumping Pound Creek, and on Moose Mountain, Rocky Mountains, 1897 ; Bow River Pass, Rocky Mountains ; Deer Park, Lower Arrow Lake, Columbia River ; on rocks by the sea at Hastings, Burrard Inlet, B.C.; by the sea at Craigflower, near Victoria, and on great boulders between tides at Comox, Vancouver Island. (*Macoun.*) On rocks, Middleton Island, Alaska. (*J. M. Macoun.*)

Var. **opaca,** ACH.

Greenland. (*Arct. Man.*) On sandstone rocks, "elbow" of South Saskatchewan, Assa., July 12th, 1879, and on rocks, Wood Mountain, Assa., June 12th, 1895. (*Macoun.*)

197. **L. muralis,** (SCHREB.) SCHÆR. var. **saxicola,** SCHÆR.

Greenland. (*Arct. Man.*) On rocks, Grand Lake, in the Bay of Islands, and on wood at Chimney Cove, Newfoundland. (*Waghorne.*) On rocks, Ste. Anne des Monts River, Gaspé Co., Que., Aug. 18th, 1882; quite common on boulders around Ottawa, Ont., and at Chelsea and King's Mountain, Que. (*Macoun.*) Cliffs on St. Matthew Island, St. Paul Island, Sitka, Unalaska and elsewhere in Alaska. (*Rothrock.*)

A specimen collected June 7th, 1897, on St. George Island, Behring Sea, by Mr. J. M. Macoun is referred here, but is more likely a new species, as suggested by Branth.

Var. **Garovaglii,** ANZ.

On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

Var. **versicolor,** FR.

On rocks, Leading Tickles, Newfoundland. (*Waghorne.*)

198. **L. pallida,** (SCHREB.) SCHÆR.

On trunks of trees and fence-rails, not uncommon.

Arctic America. (*Richardson.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On trunks of trees, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On bark of trees at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898 ; on bark of trees at Truro, N.S. ; on basswood bark, Dow's Swamp and other places around Ottawa, Ont. ; on young pine trees at Carleton Place, Carleton Co., Ont. ; on bark of trees, Central Ontario Junction, Hastings Co., Ont. ; on tree-trunks around Niagara Falls, Ont., May 14th, 1901 ; on bark of maple trees, Algonquin Park, Ont., July, 1900 ; on bark of trees, Nipigon River and Lake, Ont. ; on bark of *Alnus rubra*, Hastings, Burrard Inlet, B.C. (*Macoun.*)

Var. **cancriformis,** TUCKERM.

On large trunks in woods, McKay's Bush, Ottawa, Ont. ; on trunks of beech trees at Belleville, Hastings Co., Ont. (*Macoun.*)

199. **L. sordida,** (PERS.) TH. FR.

Greenland. (*Arct. Man.*) On rocks, Arctic America. (*Richardson.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Summit of Mount Albert, Gaspé Co., Que., August 26th, 1882 ; on rocks, Wood Mountain, Assa., June 12th, 1895. (*Macoun.*) South Fowl Lake, boundary between Minnesota and Ontario, 1897. (*Fink.*)

200. **L. frustulosa,** (DICKS.) MASS.

On rocks, Greenland. (*Vahl.*)

201. **L. subfusca,** (LINN.) ACH. var. **allophana,** ACH.

Greenland. (*Arct. Man.*) Labrador and Newfoundland. (*Waghorne* fide *Eckfeldt.*) On trees, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On beech trees at Edmonton, Ont. (*James White.*) On aspen poplar, Greenwood Township, Man. (*Thos. Walker.*) On old fence boards and logs, Sable Island, N. S., July, 1899; common on trunks and old logs at Baddeck, Grand Narrows and Margaree, Cape Breton Island, N.S., July, 1898 ; on bark of trees at Truro, N.S.; on drift wood by the sea, Jupiter River,

Anticosti, Que.; very abundant on large trunks of beech, maple and basswood, and on old rails at Ottawa, Ont.; on small trees at Aylmer, Que.; abundant at Belleville, Hastings Co., Ont.; common on trunks, Algonquin Park, Ont., June, 1900; on bark of trees, Nipigon River, Ont.; on trees along Lake Winnipegosis, Man.; on sandstone rocks, Wood Mountain, Assa., June 10th, 1895; on bark of poplar, Jumping Pound Creek, Rocky Mountains; on trees along the Columbia River at Revelstoke, B.C.; on alders along the Nechaco River, B.C.; on the old wharf at Comox, Vancouver Island. (*Macoun.*) Cook's Inlet, Unalaska, and Port Clarence, Alaska. (*Rothrock.*)

Var. **hypnorum,** Schær.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Along the Mackenzie River and around Great Bear Lake. (*Richardson.*) On earth and moss at Banff, Rocky Mountains, July 11th, 1891; on earth, Jumping Pound Creek, at the bridge, and along Bragg's Creek, foothills of Rocky Mountains. (*Macoun.*) Port Clarence and Cape Lisburne, Alaska. (*Rothrock.*)

Var. **argentata,** Ach.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On maple bark at Cove Head, Prince Edward Island; on trees at the base of King's Mountain, near Chelsea, Que., May, 1897; on bark of young poplar trees, Nipigon River, Ont.; on young trees, Sea's farm, near Victoria, Vancouver Island. (*Macoun.*)

Var. **coilocarpa,** Ach.

On ash trees at Baddeck, Cape Breton Island, N.S., July, 1898; on beech bark in woods around Ottawa, Ont.; on bark of *Alnus incana* at Jumping Pound Creek, Rocky Mountains; on poplar bark, Sea's farm, near Victoria, Vancouver Island, May 22nd, 1893. (*Macoun.*)

Var. **atrynea,** Ach.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On fences near the sea, Sable Island, N.S., July, 1899; on ash bark, Gaspé coast, August, 1882; on old logs by the sea, Oak Bay, near Victoria, Vancouver Island, June, 1887. (*Macoun.*) On logs by the sea, Hanson Island, Gulf of Georgia, B.C., 1885. (*Dr. G. M. Dawson.*)

Var. **distans,** Ach.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On bark of beech trees, McKay's woods, Ottawa, Ont., April 16th, 1891. (*Macoun.*)

Var. **minor,** Branth.

On limestone rocks, near the Hogsback, near Ottawa, Ont., May 7th, 1897. (*Macoun.*)

202. **L. Hageni,** Ach.

On rocks, dead wood and trees.

Greenland. (*Vahl.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On wood at Ottawa and London, Ont. (*A. T. Drummond.*) On fence boards, Main Station, Sable Island, N.S., July, 1899 ; on old logs, Madeline River, Gaspé Co., Que.; on old fence-rails and cedar bark at Ottawa, Ont.; on fence-rails and bark at Belleville, Hastings Co., Ont.; on old logs along Jumping Pound Creek, foothills of Rocky Mountains. (*Macoun.*) Chilliwack Valley, B.C. (*J. M. Macoun.*) Cape Lisburne, Alaska. (*Rothrock.*)

203. **L. albescens,** (Hoffm.) Fr. Th.

On logs, Chimney Cove, Newfoundland. (*Waghorne.*)

204. **L. atra,** (Huds.) Ach.

On rocks and tree trunks.

Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On trees, old rails and rocks at Ottawa, Ont.; on old rails at Brighton, Ont., 1893 ; on rocks along Jumping Pound Creek, foothills of Rocky Mountains ; on poplar trunks, Sea's farm, near Victoria, Vancouver Island, May 22nd, 1893; on the old wharf at Comox, Vancouver Island, June 23rd, 1893. (*Macoun.*) Cape Lisburne, Alaska. (*Rothrock.*)

205. **L. atriseda,** Nyl.

On rocks, Rope Cove, Bay of Islands, Newfoundland. (*Waghorne.*)

206. **L. badia,** (PERS.) ACH.

On sub-alpine rocks.

Greenland. (*Arct. Man.*) Battle Harbor, Labrador. (*Waghorne.*) Arctic America. (*Richardson.*) Tadousac, Quebec. (*A. T. Drummond.*)

207. **L. dispersa,** (PERS.) NYL.

On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

208. **L. thiodes,** (ARNOLD.) Tirol. xxx, p. 369.

On rocks, Grand Lake, Bay of Islands, Newfoundland. (*Waghorne.*)

209. **L. bicincta,** (RAM.) NYL.

On rocks, Black Islands, Newfoundland. (*Waghorne.*)

210. **L. ochraceo-rubescens,** ARNOLD.

On sandstone rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

211. **L. Pacifica,** TUCKERM.

On trees on many parts of Vancouver Island.

On poplar trees and alder at Victoria and Comox, Vancouver Island ; on small trees at Hastings, Burrard Inlet, B.C. (*Macoun.*) On bark, Alert Bay, Vancouver Island. (*Dr. G. M. Dawson.*)

212. **L. atrosulphurea,** (WAHL.) ACH.

On rocks. Arctic America. Greenland. (*Vahl.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

213. **L. varia,** (EHRH.) NYL.

Common on trees, dead wood and stones.

Greenland. (*Arct. Man.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On dead pine, Rigaud Mountain, Vandreuil Co., Que. (*Rev. G. Ducharme.*) On old rails, Main Station, Sable Island, N.S., July, 1899 ; on old rails, Margaree, Cape Breton Island, N.S., July, 1898 ; on old rails, bark of trees and boulders at Ottawa,

Ont.; on old fence-rails at Belleville, Hastings Co., Ont.; on old rails near Wooler, Northumberland Co., Ont., 1893; on *Alnus incana* along Jumping Pound Creek, foothills of Rocky Mountains ; on young poplars, Sea's farm, Victoria, and on oak trees at Comox, Vancouver Island. (*Macoun.*)

Var. **polytropa,** Nyl.

Alpine and sub-alpine rocks.

Arctic America. (*Richardson.*) Middle Greenland. (*Eberlin.*) On rocks, Labrador and Newfoundland. (*Waghorne.*) On limestone rocks at Aylmer, Que., April 25th, 1900. (*Macoun.*)

Var. **intricata,** Nyl.

Alpine and sub-alpine rocks.

Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) On rocks, Chimney Cove, Newfoundland. (*Waghorne.*)

Var. **symmicta,** Ach.

On trees and dead wood.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On old fence-rails, Main Station, Sable Island, N.S., July, 1899 ; on old rails at Margaree and Grand Narrows, Cape Breton Island, N.S., July, 1898; on bark and dead wood by the beach, Gaspé Basin, Gaspé Co., Que.; on old rails and bark of living trees at Ottawa, Ont.; on trees, Nipigon, Lake Superior ; on the old wharf at Comox, Vancouver Island. (*Macoun.*)

Var. **sæpincola,** Fr.

On dead wood ; common.

Abundant on old cedar rails and boards around Ottawa, Ont.; at Belleville, Hastings Co., Ont.; on the old wharf at Comox, Vancouver Island, June, 1893. (*Macoun.*)

214 **L. symmictera,** Nyl.

Goose Arm, Newfoundland. (*Waghorne.*)

215. **L. athroocarpa.** (Dub.) Nyl.

Trees, rocks and shrubs.

On rocks, Coal Point, Newfoundland. (*Waghorne.*) British North America. (*Richardson.*) On beech and maple trees at

Belleville, Hastings Co., Ont.; on poplar bark at Nipigon, Lake Superior; on poplar bark, Fort Chipweyan, Lake Athabasca. (*Macoun.*)

216. **L. castanea,** (Hepp.) Th. Fr.

Growing over mosses in alpine districts.
Greenland. (*Vahl.*)

217. **L. ventosa,** (Linn.) Ach.

Alpine rocks, Arctic America. (*Richardson.*) Greenland. (*Vahl.*) On rocks, Fort Chimo, Ungava Bay, Labrador, Aug. 1896. (*A. P. Low.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Summit of Mount Albert, Gaspé Co., Que.; on rocks by the sea at Nanaimo, Vancouver Island. (*Macoun.*) On rocks, St. George Island, Behring Sea. (*J. M. Macoun.*) Islands of Behring Strait. (*Wright.*)

218. **L. elatina,** Ach.

Dead bark and dead wood of coniferous trees.
Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Canada. (*A. T. Drummond.*) On spruce bark in woods at Baddeck, Cape Breton Island, N.S., July, 1898; on bark of balsam fir, Brackley Point, Prince Edward Island, 1888; on spruce bark, Ste. Anne des Monts River, Gaspé Co., Que.; abundant on hemlock bark, Algonquin Park, Ont., June, 1900; on Menzies' spruce at Comox, Vancouver Island. (*Macoun.*)

Var. **ochrophæa,** Tuckerm.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On old logs, Canaan Forks, N.B., 1892. (*J. Moser.*) On cedar bark, Tobique River, N.B., 1884. (*Geo. U. Hay.*) On bark of trees, Ste. Anne des Monts, Gaspé Co., Que., Aug., 1882; on cedar bark, Algonquin Park, Ont., June, 1900; on bark of Douglas fir, Comox, Vancouver Island, May, 1887. (*Macoun.*) Sheep Creek, near Juneau, Alaska. (*Miss G. Cooley.*)

Var. **minor,** Tuckerm.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

219. **L. pallescens,** (Linn.) Schær.

On dead wood, bark of trees and moss; common.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) On moss, summit of Mount Albert, Gaspé Co., Que.; on trees at Ottawa, Ont.; at Belleville, Hastings Co., Ont.; on trunks, rare, Algonquin Park, Ont.. June, 1900; on earth and moss, Jumping Pound Creek and Bragg's Creek, foothills of Rocky Mountains; on moss and bark at Deer Park, Lower Arrow Lake, Columbia River, B.C.; on moss, mountains south of Spence's Bridge, B.C.; on alder bark and rocks, Hastings, B.C.; on rocks, Parson's Mountain, Victoria, and Mount Benson, Nanaimo, and on bark at Comox, Vancouver Island. (*Macoun.*) On bark of beech trees at Edmonton, Ont. (*James White.*) On trees, Thurlow Island, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*) Chugachick, Cook's Inlet, Alaska. (*Rothrock.*) Sheep Creek, near Juneau, Alaska. (*Miss G. Cooley.*)

Var. **Upsalensis,** (Linn.)

Greenland. (*Arct. Man.*) On earth at Wood Mountain, Assa.; on earth and moss at Bragg's Creek and Jumping Pound Creek, Rocky Mountains; on earth on rocks, Parson's Mountain and Pier's farm, Victoria, Vancouver Island. (*Macoun.*) Kotzebue Sound, Alaska. (*Turner.*)

Var. **rosella,** Tuck.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On bark of trees, Thurlow Island, Gulf of Georgia, B.C., July 25th, 1885. (*Dr. G. M. Dawson.*) On Douglas fir at Comox, Vancoucer Island, April 30th, 1887. (*Macoun.*) Sheep Creek, Juneau, Alaska. (*Miss G. Cooley.*)

220. **L. tartarea,** (Linn.) Ach.

Upon rocks, earth and mosses.

West Greenland. (*Warming.*) On rocks, Baffin Land, Hudson Strait, Aug., 1897. (*Dr. R. Bell.*) Various forms on Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On earth, Barren Grounds, Lat. 61 , Long. 104°, W. (*J. W. Tyrrell.*) Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On earth, Salt

Lake, Anticosti, Que.; on rocks, Sea's farm, Victoria, Vancouver Island. (*Macoun.*) St. George and St. Paul islands, Behring Sea. (*J. M. Macoun.*) Shumigan Group, Unalaska and Cape Lisburne, Alaska. (*Rothrock.*)

The form named *L. leprosa* by Nylander was found on earth on Sable Island, N.S., July, 1899. (*Macoun.*)

Var. **frigida,** (Sw.)

Greenland. (*Arct. Man.*) On rocks, St. Paul Island, Behring Sea, June 19th, 1897. (*J. M. Macoun.*) Kotzebue Sound, Alaska. (*Turner.*)

221. **L. oculata,** (Dicks.) Ach.

Incrusting mosses and other substances in alpine districts.

Greenland. (*Vahl.*) On rocks in the Barren Grounds, Lat. 61°, Long. 104° W., July, 1893. (*J. B. Tyrrell.*) Islands of Behring Strait. (*Wright.*) On rocks, St. Paul Island, Behring Sea, June 19th, 1897. (*J. M. Macoun.*)

222. **L melanaspis,** (Vahl.) Ach.

On rocks, Greenland. (*Vahl.*)

223. **L. verrucosa,** (Ach.) Laur.

Upon mosses and earth in alpine districts.

Greenland. (*Vahl.*) On dead stems of *Selaginella rupestris*, along Jumping Pound Creek, Rocky Mountains, June 15th, 1897. (*Macoun.*) Eschscholtz Bay, Arctic Ocean, Alaska. (*Rothrock.*)

224. **L. cenisia,** Ach.

On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On limestone rocks, Hogsback, Rideau River, near Ottawa, Ont., May 2nd, 1897. (*Macoun.*)

225. **L. cinerea,** (Linn.) Sommerf.

On rocks, Arctic America. (*Richardson.*) Greenland. (*Arct. Man.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Canada. (*A. T. Drummond.*) On limestone rocks along the Rideau River, south of Ottawa, Ont., May 2nd, 1897; on rocks, Lake Nipigon, Ont., 1884. (*Macoun.*) Port Clarence, Icy Cape, and Cape Lisburne, Alaska. (*Rothrock.*)

Var. **lævata,** Fr.

On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

226. **L. gibbosa,** Nyl.

Chimney Cove, Labrador. (*Waghorne.*) On rails, Canada. (*A. T. Drummond.*) On old cedar rails, Mr. James Terrill's farm, near Wooler, Northumberland Co., Ont., Oct. 16th, 1898; on flat limestone rocks, Blueberry Point, Aylmer, Que., April 25th, 1900. (*Macoun.*) Alaska. (*Rothrock.*)

227. **L. calcarea,** (Linn.) Sommerf.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Greenland. (*Arct. Man.*) On limestone rocks, Rideau River, Ottawa, Ont., May 2nd, 1897; on rocks, Deer Park, Columbia River, B.C., June 7th, 1890. (*Macoun.*)

Var. **contorta,** Fr.

On calcareous rocks, Greenland. (*Vahl.*)

228. **L. cinereo-rufescens,** Nyl.

On rocks, Chimney Cove, also the form *Lecanora sanguinea* Kplh, on stones at Birchy Cove, Newfoundland. (*Waghorne.*)

229. **L. cæsio-cinerea,** (Nyl.) Eckfeldt.

On rocks, Chimney Cove, Newfoundland. (*Waghorne.*)

230. **L. lacustris,** (With.) Nyl.

On rocks often inundated.
Greenland. (*Vahl.*) On rocks, Grand Lake, Newfoundland. (*Waghorne.*)

231. **L. epulotica,** (Ach.) Leight.

On rocks, Newfoundland. (*Waghorne.*)

Var. **subepulotica,** Nyl.

On granitic rocks, Canada. (*A. T. Drummond.*)

232. **L. molybdina,** (WAHL.) ACH. var. **vulgaris,** SCHÆR.

On maritime rocks, Greenland. (*Vahl.*) Elsewhere in Arctic America. (*Dr. Kane.*) On rocks at Tadousac, Que. (*A. T. Drummond.*)

Var. **ereutica,** WAHL.

On rocks at Tadousac, St. Lawrence River, Que. (*A. T. Drummond.*)

233. **L. chlorophana,** (WAHL.) ACH.

Alpine rocks, and at lower elevations.
Greenland. (*Vahl.*) On boulders in southern Assiniboia, not uncommon, June, 1895. (*Macoun.*)

234. **L. xanthophana,** (NYL.)

On rocks at Rivière du Loup, Que. (*C. G. Pringle.*)

235. **L. Schleicheri,** (ACH.) NYL.

Not uncommon on earth at the forks of Old Wives' Creek, Assa., June 2nd, 1895. (*Macoun.*)

236. **L. laxa,** BRANTH. (MS.)

On limestone rocks along the Rideau River near Hogsback, near Ottawa, Ont., April 30th, 1897. (*Macoun.*)

237. **L. cervina,** (PERS.) NYL.

On rocks near the Milk River, southern Assiniboia, June, 1895. (*Macoun.*) Eschscholtz Bay, Alaska. (*Rothrock.*)

238. **L. glaucocarpa,** (WAHL.) ACH.

On calcareous rocks.
Arctic America. (*Richardson.*) On rocks, Meadows, Goose Arm, Newfoundland. *Waghorne.*)

239. **L. fuscata,** (SCHRAD.) TH. FR.

On granitic rocks. Arctic America. (*Richardson.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On limestone

rocks, Rideau River, south of Ottawa, Ont., May 2nd, 1897. (*Macoun.*)

Var. **rufescens,** Th. Fr.

On granitic rocks. Arctic America. (*Richardson.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

240. **L. privigna,** (Ach.) Nyl.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On granitic rocks, Tadousac, Que. (*A. T. Drummond.*) On rocks, Ste. Anne des Monts River, Gaspé Co., Que. (*Macoun.*)

Var. **pruinosa,** Auctt.

On limestone rocks along the St. Lawrence, at Quebec. (*A. T. Drummond.*) On limestone rocks along Jupiter River, Anticosti, Que. ; on limestone rocks around Ottawa, Ont., common. (*Macoun.*)

241. **L. platycarpoides,** (Anzi.)

On sandstone rocks along Jumping Pound Creek, Rocky Mountains, Alta., June 15th, 1897. (*Macoun.*)

242. **L. flavada,** Hepp.

On stones, Coal River, Newfoundland. (*Waghorne.*)

243. **L. effusa,** Pers.

On wood, River Head, Chimney Cove, McIver's Cove, and Benoit's Cove, Newfoundland. (*Waghorne.*)

244. **L. pinniperda,** (Kœrb.)

On an old plank at Crabbs, Newfoundland. (*Waghorne.*)

245. **L. detractula,** (Nyl.)

On stones in Lark Harbour, Newfoundland. (*Waghorne.*)

25. RINODINA, Mass.

246. **R. nimbosa,** (Fr.) Th. Fr.

Naked earth in alpine or northern districts.
Greenland. (*Vahl.*)

247. **R. oreina,** (ACH.) MASS.

Greenland. (*Arct. Man.*) On rocks at the " elbow " of the South Saskatchewan, Assa., July 13th, 1879; also on Laurentian rocks at Shannonville, Hastings Co., Ont.; abundant on boulders on the prairie throughout Assiniboia, June, 1895. (*Macoun.*)

248. **R. Ascociscana,** TUCKERM.

On trunks, Quebec. (*A. T. Drummond.*) On beech trees at Belleville, Hastings Co., Ont., April 20th, 1879; on beech trees at Ottawa, Ont., April 29th, 1891; also in woods at Billings Bridge, near Ottawa, April, 1897. (*Macoun.*)

249. **R. turfacea,** (WAHL.) NYL.

On the earth and running over mosses in alpine and northern districts.

Greenland. (*Vahl.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On earth, north shore of Lake Superior; on earth in woods at Banff, on Moose Mountain and at Morley, Rocky Mountains; in Roger's Pass, Selkirk Mountains, B.C. (*Macoun.*) Islands of Behring Strait. (*Wright.*)

Var. **mniaræa,** NYL.

Greenland. (*Arct. Man.*) Along Bragg's, Creek foothills of Rocky Mountains; on earth at Hector in the Rocky Mountains; northern British Columbia. (*Macoun.*) On islands in Behring Strait. (*Wright.*)

250. **R. succedens,** NYL.

Wild Cove, M'Iver's Cove, Frenchman Cove, Middle Arm and Chimney Cove, Newfoundland. (*Waghorne.*)

251. **R. teichophila,** NYL.

On rocks, Chimney Cove, Little Harbour, Newfoundland. (*Waghorne.*)

252. **R. sophodes,** (ACH.) NYL.

Common on bark.

Greenland. (*Arct. Man.*) On bark of trees, John's Beach, Deer Lake, and on rocks, Chimney Cove, Newfoundland. (*Waghorne.*)

Quite common on bark of young red maples in the vicinity of Ottawa, Ont.; on maple trees at Belleville, Hastings Co., Ont; on bark, Parson's Mountain, near Victoria, Vancouver Island. (Doubtful.) (*Macoun.*)

Var. **atrocinerea,** NYL.

On rocks at Shannonville, Hastings Co., Ont., Oct., 1882. (*Macoun.*)

Var. **confragosa,** NYL.

On maple trees at Belleville, Hastings Co., Ont.; on young poplars, Sea's farm, near Victoria, Vancouver Island, May 22nd, 1893. (*Macoun.*)

Var. **exigua,** FR.

Greenland. (*Arct. Man.*) On limestone rocks in Rockcliffe Park, and at the Hogsback, 4 miles from Ottawa, Ont., April, 1897; on old fence-rails at Brighton, Northumberland Co., Ont.; on bark, North Bay, Lake Nipissing; on poplar bark, Lake Nipigon, Ont.; on green ash bark at Old Wives' Creek, Assa., June, 1895; on poplar bark, Jumping Pound Creek, Rocky Mountains, June, 1897; on bushes in woods at Comox, Vancouver Island, June 23rd, 1893. (*Macoun.*)

253. **R. constans,** (NYL.) TUCKERM.

On living and dead wood.

On bark of living beech at Ottawa, Ont.; on old logs at Hastings, Burrard Inlet, B.C. (*Macoun.*)

26. PERTUSARIA, DC.

254. **P. bryontha.** (ACH.) NYL.

On earth, growing over mosses, in alpine and northern districts.

Greenland. (*Vahl.*) Growing over mosses, L'Anses au Mort, Labrador. (*Waghorne.*) Shores of St. Mary's River, Lake Superior. (*Richardson.*) Islands of Behring Strait. (*Wright.*)

255. **P. velata,** (TURN.) NYL.

On trees, rails and rocks.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On trunks at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898; quite common on trunks and rails in many localities around Ottawa, Ont.; on bark of trees at Belleville, Hastings Co., Ont.; on fence-rails, Central Ontario Junction, Hastings Co.; at Brighton, Northumberland Co., Ont.; on trunks, Queenston Heights, Ont., May 9th, 1901. (*Macoun.*) On bark, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On beech trunks at Edmonton, Ont. (*James White.*)

256. **P. panyrga,** (ACH.) TH. FR.

On the earth running over mosses in alpine and northern districts.

Greenland. (*Vahl.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On moss on rocks, St. Paul Island, Behring Sea, July, 1897. (*J. M. Macoun.*)

257. **P. multipuncta,** (TURN.) NYL.

On trees or more rarely on rocks.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Quite common on trunks, chiefly birch, at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898; on trees at Truro, N.S.; on spruce trees, Anticosti, Que.; on ash trees, Ste. Anne des Monts River, Gaspé Co., Que.; on maple, cedar and other trees, common at Ottawa, Ont.; on trees at Belleville, Hastings Co., Ont.; on trees, Algonquin Park, Ont., June, 1900; at Sudbury Junction, Ont.; on poplar trees along Jumping Pound Creek, Rocky Mountains, June, 1897; on poplar trees, Deer Park, Lower Arrow Lake, Columbia River, B.C.; on bark of oak trees at Victoria, Vancouver Island. (*Macoun.*) On poplar trunks at Edmonton, Ont. (*James White.*)

258. **P. dactylina,** (ACH.) NYL.

On earth running over mosses in alpine and northern districts.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On mountain summits at Hector, Rocky Mountains. (*Macoun.*) On Unalaska and St. Paul islands, Behring Sea. (*J. M. Macoun.*) Islands of Behring Strait. (*Wright.*)

259. **P. ambigens,** (Nyl.) Tuckerm.

On trees at Comox, Vancouver Island, May 2nd, 1887. (*Macoun.*) On bark of Douglas fir, Pearce Island, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*)

260. **P. rhodocarpa,** Koerb.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On bark, Arctic America. (*Nylander.*) On trees, northern British Columbia, June, 1875. (*Mac un.*)

261. **P. communis,** DC.

On trunks and rocks.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On trunks at Baddeck and Margaree, Cape Breton Island, N.S.; on trees, Madeline River, Gaspé Co., Que.; on trees and rocks in woods at Ottawa, Ont.; and on trunks, Aylmer, Que.; on beech trunks at Belleville, Hastings Co., Ont.; on trunks, Jordan station, Lincoln Co., Ont., May 17th, 1901 ; on trees, Canfield Junction, Haldimand Co., Ont.; on maple bark, Algonquin Park, Ont., July, 1900 ; on trees, falls of Nipigon River, Ont. (*Macoun.*) On bark, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*)

262. **P. leioplaca,** (Ach.) Schær.

On trees and rocks.

On bark of trees at River Head, Sparrible Cove, and Middle Arm, Newfoundland. (*Waghorne.*) Canada. (*Richardson.*) On trees, Ste. Anne des Monts River, Gaspé Co., Que.; on trees at Amqui station, Intercolonial Railway, Que.; on trunks in woods, at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898 ; on beech trees in woods at Buckingham, Que., 1896. (*Macoun.*)

The above includes *P. lævigata,* Nyl., which has not been separated by us.

263. **P. pustulata,** (Ach.) Nyl.

On bark of trees and dead wood.

Coast of Gaspé, Que.; on old cedar rails north of Aylmer, Que., May, 1897 ; on bark of trees at Belleville, Hastings Co., Ont.; on alder trees at Revelstoke, B.C. (*Macoun.*)

UNIVERSITY OF CALIFORNIA

264. **P. glomerata,** (ACH.) SCHÆR.

On earth, running over mosses in alpine and northern districts. On earth in Baffin Land, Hudson Strait, Aug., 1897. (*Dr. R. Bell.*) On earth near Forteau, Labrador. (*Waghorne.*) Running over mosses on islands in Lake Nipigon, July 12th, 1884. (*Macoun.*) Islands of Behring Strait. (*Wright.*) Port Mulgrave, Alaska. (*Rothrock.*)

265. **P. globularis,** ACH.

On rocks amongst mosses.
Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

266. **P. Wulfenii,** DC.

On trunks, Que. (*A. T. Drummond.*) On beech trees at Ottawa, Ont., April 21st, 1891 ; also at Billings Bridge, Ont., and Hull, Que. These specimens are placed here on authority but in the opinion of the writer are doubtful. (*Macoun.*)

267. **P. (Variolaria) Waghornei,** HULTING.

On bark of trees in company with *Pertusaria lævigata* at Whitmore, Newfoundland. (*Waghorne.*)

268. **P. (Variolaria) lactea,** WULF.

On stones at Shoal Point, Newfoundland. (*Waghorne.*) The last two species are very likely included in the sorediferous forms of *Pertusaria multipuncta* and *communis.*

27. CONOTREMA, Tuckerm.

269. **C. urceolatum,** (ACH.) TUCKERM.

On maple trunks, Hunter's River, Prince Edward Island ; on trunks at Baddeck and Magaree, Cape Breton Island, N.S., July, 1898 ; on bark of trees at Ottawa, Ont.; on maple bark at Belleville and Central Ontario Junction, Hastings Co., Ont.; on poplar trees at Brighton, Ont.; on *Carya amara* in woods west of Hull, Que.; on maple trees, Otter Slide Creek, Algonquin Park, Ont., July, 1900. (*Macoun.*)

28. GYALECTA, (Ach.) Anzi.

270. **G. lutea,** (Dicks.) Tuckerm.

On bark of trees.

On hemlock bark at Beechwood, Ottawa, Ont.; on spruce bark along the Red Deer River, Porcupine Mountains, Man. (*Macoun.*)

271. **G. Pineti,** (Schrad.) Tuckerm.

On bark and rotten wood at the base of trees.

On dead wood in woods, Sudbury Junction, Ont., May 29th, 1884. (*Macoun.*)

272. **G. rhexoblephara,** (Nyl.) Tuckerm.

On earth, growing over mosses, &c.

Greenland. (*Vahl.*) Islands of Behring Strait. (*Wright.*)

29. URCEOLARIA, Tuckerm.

273. **U. scruposa,** (Linn.) Nyl.

On rocks and on earth and often growing over mosses.

On earth, Labrador or Newfoundland with var. *bryophila*, Eschw. (*Waghorne* fide *Eckfeldt.*) Arctic America. (*Richardson.*) On rocks, Lake Nipigon, Ont.; on the prairie north of Cypress Hills, Assa.; common on earth along Old Wives' Creek and south of Wood Mountain, Assa.; on earth and roots along Jumping Pound Creek, Rocky Mountains, June, 1897; on earth at Revelstoke and Deer Park, Columbia River, B.C.; on earth in Roger's Pass, Selkirk Mountains, B.C. (*Macoun.*) Alaska. (*Rothrock.*)

30. THELOTREMA, (Ach.) Eschw.

274. **T. lepadinum,** (Ach.)

On bark of trees and dead wood.

On bark of trees, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Arctic America. (*Richardson.*) On ash trees at Ottawa, Ont.; on Douglas fir, Victoria, Vancouver Island and on *Alnus rubra* at Comox, and Alberni, Vancouver Island. (*Macoun.*)

275. **T. subtile,** (TUCKERM.) ECKFELDT.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

31. STEREOCAULON, Schreb.

276. **S. coralloides,** FR.

Greenland. (*Arct. Man.*) On rocks, Arctic America. (*Herb. Hooker.*) At Nain, Labrador, and on Digge's Island, Hudson Strait, 1884. (*Dr. R. Bell.*) On rocks near Whale River and at Clearwater Lake, Labrador, 1898. (*A. P. Low.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Barren Grounds, Lat. 61°, Long. 104°, July 24th, 1893. (*J. B. Tyrrell.*) On rocks, Tadousac, Que. (*A. T. Drummond,*) On Mount Aylmer, Devil's Lake, Rocky Mountains, alt. 8,000 feet ; common on rocks at Victoria, Vancouver Island. (*Macoun.*) Unalaska Island, Behring Sea. (*J. M. Macoun.*)

277. **S. paschale,** (LINN.) FR.

On earth and stones quite common.

Greenland. (*Arct. Man.*) Arctic America. (*Herb. Hooker.*) On rocks, Baffin Land, Hudson Strait, 1897. (*Dr. R. Bell.*) Indian Harbour and Eagle River, Labrador. (*Waghorne.*) On rocks, Tadousac, Que. (*A. T. Drummond.*) Rocky islands, Stony Lake, Peterborough Co., Ont. (*Thos. Walker.*) On rocks, Savanne, west of Lake Superior. (*W. McInnes.*) On boulders in woods at Margaree, Cape Breton Island, N.S., July, 1898; on earth, Tobique River, N.B.; along the Ste. Anne des Monts River, Gaspé Co., Que.; rather frequent on boulders around Ottawa, Ont.; on boulders, Algonquin Park, Ont., July, 1900 ; quite common on rocks, Thunder Bay, Lake Superior; on rocks and earth, Hastings, Burrard Inlet, B.C.; on Mount Benson near Nanaimo, Vancouver Island. (*Macoun.*) On rocks, Thurlow Island, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*) On rocks, Kingston Mills, Ont., Sept. 23rd, 1901 ; on St. George and St. Paul islands, Behring Sea, and Kadiak Island, Alaska. (*J. M. Macoun.*) Kotzebue Sound, Alaska. (*Turner.*) Common everywhere in Alaska. (*Rothrock.*)

278 **S. tomentosum,** (FR.) TH. FR.

On earth and stones.

Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) Indian Harbour, Labrador ; Birchy Cove, Clark's Brook, Bay of Islands,

Newfoundland. (*Waghorne.*) On stones at Lancaster, and on earth along the Tobique River, N.B. (*G. U. Hay.*) On rocks, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On boulders at Baddeck, Cape Breton Island, N.S., July, 1898; on stones at Truro, N.S.; on stones along Jupiter River, Anticosti, Que.; on rocks, Cape Rosier, Gaspé Co., Que.; on stones at Ottawa, Ont.; on rocks, Lake Superior and on earth at Lake Nipigon; on rocks in woods at Banff, Jumping Pound Creek, Bragg's Creek and Castle Mountain, Rocky Mountains; on rocks near McLeod's Lake, B.C.; on rocks at Hot Springs, Kootenay Lake, B.C.; on rocks, Salt Spring Island, Gulf of Georgia; on rocks at Victoria, Vancouver Island. (*Macoun.*) Rocky Mountains. (*Bourgeau.*) Mountains east of Adam's Lake, B.C. (*Dr. G. M. Dawson.*) Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*) Alaska. (*Dr. Kellogg.*) Sheep Creek, near Juneau; Davidson Glacier, Alaska, (*Miss G. Cooley.*)

Var. **alpinum,** TH. FR.

Greenland. (*Vahl.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Arctic America. (*Richardson.*) Islands of Cumberland Gulf. (*Howgate.*) Islands of Behring Strait. (*Wright.*)

279. **S. denudatum,** (FLOERK.)

On rocks, Greenland. (*Dall.*) North Bluff and Nottingham Island, 1885. (*Dr. R. Bell.*) On rocks, Clearwater River, Labrador, July, 1896. (*A. P. Low.*) Venison Tickle, Eagle River and Indian Harbour, Labrador. (*Waghorne.*) Newfoundland. (*Despreaux.*) Summit of Mount Albert, Gaspé Co., Que. (*Macoun.*) Alaska. (*Dr. Kellogg.*)

280. **S. condensatum,** HOFFM.

On rocks, Clearwater Lake, northern Labrador, July, 1896. (*A. P. Low.*) On rocks, Baffin Land, July, 1897. (*Dr. R. Bell.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

281. **S. pileatum,** (ACH.)

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On stones along Jupiter River, Anticosti, Aug., 1883; on boulders at Baddeck and Margaree, Cape Breton Island, July, 1898. (*Macoun.*)

282. **S. Wrightii,** TUCKERM.

On rocks, islands of Behring Strait. (*Wright.*)

283. **S. nanum,** ACH.

On rocks, Parson's Mountain, near Victoria, Vancouver Island, May 19th, 1893. These specimens are depauperate and quite white.

284. **S. nanodes,** TUCKERM.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

32. PILOPHORUS, Th. Fr.

285. **P. cereolus,** (ACH.) var. **Fibula,** TUCKERM.

On rocks, bordering water courses. (*Tuckerman.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On rocks at Belleville, Hastings Co., Ont., 1882. (*Macoun.*) Sawmill Creek, Sitka, Alaska. (*Rothrock.*) Alaska. (*Turner.*)

Var. **acicularis,** TUCKERM.

Pacific Coast. (*Menzies.*) Rocky Mountains. (*Herb. Hooker.*) On rocks at Yale, B.C.; on Parson's Mountain near Victoria, Vancouver Island, and on Salt Spring Island, Gulf of Georgia, B.C. (*Macoun.*) On rocks, St. Paul Island, Behring Sea. (*J. M. Macoun.*) Juneau, alt. 3,000 feet; Salmon Creek and Gold Creek Cañon, near Juneau, Alaska. (*Miss G. Cooley.*)

Var. **robustus,** TUCKERM.

Islands of Behring Strait. (*Wright. Turner.*) On Parson's Mountain, Vancouver Island and Salt Spring Island, Gulf of Georgia; specimens with branching and corymbose summit were obtained. (*Macoun.*) On rocks, St. Paul Island, Behring Sea, June 19th, 1897. (*J. M. Macoun.*)

286. **P. clavata,** FRIES. N. SP.

On large boulders, Salt Spring Island, Gulf of Georgia, B.C., May 9th, 1887. This species is easily distinguished by its elongated club-shaped apothecia. When named by Fries no description was given.

33. CLADONIA, Hoffm.

287. **C. alcicornis,** (LIGHTF.) FLŒRKE.

Sterile, sandy earth.

Greenland. (*Arct. Man.*) Arctic America. (*Hooker.*) On earth, Cape Rosier, Gaspé Co., Que.; on the summit of Mount Albert, Gaspé Co., Que.; on earth at Truro, N.S., June 12th, 1883; on limestone rocks at Hull, and at Chelsea and King's Mountain, Que. (*Macoun.*) On rocks, Stony Lake, Peterborough Co., Ont. (*Thos. Walker.*) On earth, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On earth on rock, Kingston Mills, Ont., Sept. 23rd, 1901; St. Paul Island, Behring Sea, 1897. (*J. M. Macoun.*)

288. **C. symphycarpa,** FR.

On earth.

Labrador or Newfoundland with the var. *epiphylla*, Ach. (*Waghorne* fide *Eckfeldt.*) Tunnel Mountain, Banff, Rocky Mountains. (*Macoun.*) Cook's Inlet, at Fort Alexander, Alaska. (*Rothrock.*)

289. **C. Mitrula,** TUCKERM.

On earth in McKay's bush and at Britannia, six miles from Ottawa, Ont.; on earth on an old stump in pine woods, Seymour West, Northumberland Co., Ont.; on earth in woods, Camlachie, Lambton Co., Ont., June 18th, 1901. (*Macoun.*) Juneau, Alaska. (*Miss G. Cooley.*)

290. **C. cariosa,** (ACH.) SPRENG.

On earth and logs.

Battle Harbour, Labrador. (*Waghorne.*) Arctic America. (*Richardson.*) On earth, Cape Rosier, and Fox River, Gaspé Co., Que.; rather common on earth at Ottawa, Ont.; on earth at Belleville, Hastings Co., Ont.; on old logs in woods, Camlachie, Lambton Co., Ont., June 18th, 1901. (*Macoun.*) On earth, Nipigon River, and Lake Maria, Ont.; Island Lake, Algonquin Park, Ont., July, 1900; on earth at Banff and along the Elbow River and on Moose Mountain, Rocky Mountains; at Donald and Deer Park, Columbia River, B.C.; on earth along the Fraser River at Quesnel, B.C. *Macoun.*)

291. **C. decorticata,** FLOERK.

On earth and rocks.

Cape Chudleigh, Hudson Strait. (*Dr. R. Bell.*) Bay of Islands, Newfoundland. (*Waghorne.*) Barren Grounds, Lat. 61°, Long. 104°,W. (*J. W. Tyrrell.*) On earth, Lake Nipigon, July, 1884; on earth along Jumping Pound Creek, Rocky Mountains, June, 1897; on rocks at Hastings, Burrard Inlet, B.C.; on Sea's farm, Victoria, Vancouver Island. (*Macoun.*) Chilliwack Valley, B.C., 1901; Unalaska and Kadiak Island, Alaska, and St. Paul Island, Behring Sea. (*J. M. Macoun.*)

292. **C. pyxidata,** (LINN.) FR.

On earth, rocks, logs and stumps; common everywhere.

Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) Nottingham Island, Hudson Strait. (*Dr. R. Bell.*) On earth at Clearwater Lake, Labrador, July, 1896. (*A. P. Low.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On rocks, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) At Edmonton, Ont. (*James White.*) On old logs and earth, Credit Forks and at Stony Lake, Peterborough Co., Ont. (*Thos. Walker.*) On earth, east end of Sable Island, N.S., July, 1899; common on earth and logs at Baddeck and Margaree, Cape Breton Island, N.S., 1898; along Jupiter River, Anticosti, Que.; at Cape Rosier, Gaspé Co., Que.; common around Ottawa, Ont.; quite common at Belleville, Ont.; on earth, Queenston Heights, Ont., May 19th, 1901; on rocks, Algonquin Park, Ont., June, 1900; abundant at Thunder Bay, Lake Superior and along Lake Nipigon; Red Deer River and Lake Winnipegosis, Man.; in woods at Banff, Jumping Pound Creek and Moose Mountain, Rocky Mountains; at Deer Park, Lower Arrow Lake, Columbia River, B.C.; on old logs at Kamloops, B.C.; common at Victoria and on Mount Arrowsmith, Vancouver Island. (*Macoun.*) Thurlow Island, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*) On St. Paul Island, Behring Sea. (*J. M. Macoun.*) Chamisso Island; Eschscholtz Bay, and Elephant Point; Aliaska Peninsula, Alaska. (*Rothrock.*) Kotzebue Sound, Alaska. (*Turner.*)

Var. **Pocillum,** ACH.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Great Bear Lake, Arctic America. (*Richardson.*) On open prairie at

Old Wives' Creek, Assa.; on earth at the base of trees, Bragg's Creek, Rocky Mountains, 1897; on earth, Rockcliffe Park, Ottawa, Ont. (*Macoun.*) Islands of Behring Strait. (*Wright.*) Cape Vancouver, Unalaska Island, and St. George Island, Behring Sea. (*J. M. Macoun.*)

293. **C. fimbriata,** (Linn.) Fr.

On earth and rotten logs, quite common.

Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) On earth, Clearwater Lake, Labrador, 1896. (*A. P. Low.*) On stones, L'Anse au Clair, Labrador; also John's Beach, Newfoundland. (*Waghorne.*) On earth at Edmonton, Ont. (*James White.*) On earth, rather rare, Sable Island, N.S., July, 1899; on old stumps at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898; on earth, Cape Rosier, Gaspé Co., Que.; rather common on logs and stumps around Ottawa, Ont.; on dead wood, Seymour West, Northumberland Co., Ont.; on old stumps, Algonquin Park, Ont., June, 1900; rotten wood along Nipigon River, Ont.; on earth and logs, Lake Winnipegosis, Man.; on earth Cypress Hills, Assa.; on earth at Agassiz, B.C.; on old logs, Deer Park, Lower Arrow Lake, Columbia River, B.C.; on earth at Victoria and Nanaimo, Vancouver Island. (*Macoun.*)

Var. **tubæformis,** Fr.

Very common on rotten wood.

On rocks, L'Anse au Clair, Labrador. (*Waghorne.*) Along the Tobique River, N.B. (*G. U. Hay.*) On old logs and stumps at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898; on old logs at Britannia, Dow's swamp and other localities near Ottawa, Ont.; on earth and rotten logs, Belleville, Hastings Co., Ont.; on rotten logs, Seymour West, Northumberland Co., Ont.; on old logs, Algonquin Park, Ont., June, 1900; on earth at Lake Nipigon, Ont.; Port Colborne, Lake Erie, Ont.; on rotten logs, Lake Winnipegosis, Man.; on rotten logs, Cypress Hills, Assa.; on earth at Hector, and on old logs along Jumping Pound Creek, Rocky Mountains; on old logs at Revelstoke, B.C.; on earth, Deer Park, Lower Arrow Lake, Columbia River, B.C.; on earth on rocks at Agassiz, B.C.; on dead wood at Comox, Vancouver Island. (*Macoun.*) Crow's Nest Pass, Rocky Mountains; Adam's Lake Mountains, B.C.; Deceit Bay, Gulf of

Georgia, B.C. (*Dr. G. M. Dawson.*) Chilliwack Valley, B.C.; Port Etches, Alaska. (*J. M. Macoun.*) Sheep Creek, Juneau, Alaska. *Miss G. Cooley.*)

Var. **radiata,** Fr.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On old logs, Little Fox River, Gaspé Co., Que.; on the Porcupine Mountains, Man.; on earth on rocks at Agassiz, B.C. (*Macoun.*)

294. **C. degenerans,** Floerk.

Greenland. (*Arct. Man.*) Battle Harbour, Labrador ; Meadows, Newfoundland. (*Waghorne.*) On earth in Canada. (*Agassiz.*) Arctic America. (*Richardson.*) On the summit of Mount Albert, Shickshock Mountains, Gaspé Co., Que., Aug., 1882 : on rocks, Deer Park, Columbia River, B.C., 1890. (*Macoun.*) On earth, St. Paul Island, Behring Sea, 1897. (*J. M. Macoun.*)

295 **C. gracilis,** (Linn.) Nyl. var. **verticillata,** Fr.

On earth in various forms from the Atlantic to the Pacific.

On earth, Coal River and Eagle River, Newfoundland. (*Waghorne.*) Greenland. *(Arct. Man.)* Along the Tobique River, N. B., 1884. (*G. U. Hay.)* Brackley Point, Prince Edward Island, 1888 ; on earth at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898 ; on old land, rather rare, Sable Island, N.S., July, 1899 ; on boulders and earth around Ottawa, Ont.; on pine stumps, Seymour West, Ont.; along Nipigon River, Ont., 1884; at Donald, Columbia River, B.C., 1885 ; on rocks, Parson's Mountain, Vancouver Island, 1893. (*Macoun.*) Knox Bay, Gulf of Georgia, B. C., 1885. (*Dr. G. M. Dawson.*) Sitka and Kotzebue Sound, Alaska. (*Turner.*)

Var. **hybrida,** Schær.

Quite common on earth, rocks and logs in woods.

Greenland. (*Arct. Man.*) On earth, Clearwater Lake, Labrador, 1896. (*A. P. Low.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Fort Good Hope, Mackenzie River, 1892. (*Miss E. Taylor.*) On earth along the Tobique River, N.B. (*G.U. Hay.*) On rocks, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On old logs at Edmonton, Ont. (*James White.*) On rotten logs, Credit Forks, Ont.; at Port Arthur, Lake Superior ;

and Yorkton, Assa. (*Thos. Walker.*) On old stumps at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898 ; Brackley Point, Prince Edward Island, 1888; Cape Rosier and Shickshock Mountains, Gaspé, 1882 ; on old stumps at Ottawa, Belleville and Seymour West, Ont.; on earth, Algonquin Park, Ont., June, 1900; common on north shore of Lake Superior and at Lake Nipigon ; at Lake Winnipegosis, Man., 1885 ; common at Banff, Rocky Mountains, 1891 ; on earth, Jumping Pound Creek, Bragg's Creek and Mount Forget-me-not, Rocky Mountains, June, 1897; at Pass Creek, Sproat Mountain, Revelstoke and Deer Park, Columbia River, B.C. ; in woods at Hastings, B.C., 1889 ; along the Telegraph Trail, B.C., 1875. (*Macoun.*) Mountains east of Adam's Lake, B.C., 1888; Deceit Bay, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*)

Var. **elongata,** Fr.

Quite common in the cool north woods.

At Nain, coast of Labrador. (*Dr. R. Bell.*) On earth Clearwater Lake, Labrador. (*A. P. Low.*) Blanc Sablon and L'Anse au Mort, Labrador, and Bolster Rock, Newfoundland ; numerous forms. (*Waghorne.*) In the Barren Lands, Lat. 62° 03′, Long. 103° 15′ W., 1893. (*J. W. Tyrrell.*) At Dalhousie, N.B. (*J. Fletcher.*) Along the Tobique River, N.B. (*G. U. Hay.*) Canaan Forks, N. B. (*J. Moser.*) Both forms were common in woods at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898 ; on earth at Truro, N.S., 1883 ; swamps at Cape Rosier, Gaspé, 1882 ; on an old pine log at Stittsville near Ottawa, Ont. ; on earth at Lake Nipigon, Ont., 1884 ; on old logs, Red Deer River and Porcupine Mountains, Man., 1881 ; along Bragg's Creek and Jumping Pound Creek, Rocky Mountains, 1897 ; both forms *macroceras* and *chordalis* in mountain woods, Vancouver Island and at Hastings, B.C. (*Macoun.*) Mountains south of Tulameen River, B.C. (*Dr. G. M. Dawson.*) Chilliwack Valley, B.C.; St. Paul Island, Behring Sea, 1892. (*J. M. Macoun.*)

296. **C. cornuta,** (Linn.) Fr.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On earth, Smoky Mountain, Cape Breton Island, N.S., Aug. 2nd, 1898; on the ground northeast coast of Lake Superior ; on earth in woods at Donald and Revelstoke, Columbia River, B.C.; along

the Telegraph Trail and Blackwater River, northern British Columbia, 1875. (*Macoun.*) British Columbia. (*Lyall.*)

297. **C. turgida,** (EHRH.) HOFFM.

Quite common on earth in damp woods.

Arctic America. (*Richardson.*) Newfoundland. (*Despreaux.*) On earth, Leading Tickle, Newfoundland. (*Waghorne.*) On earth along the River Rouge, Argenteuil Co., Que. (*D'Urban.*) At Domville, Que. (*N. K. Berg.*) North shore of Lake Superior. (*Agassiz.*) On earth on rocks at Margaree, Cape Breton Island, N.S., July 20th, 1898; Truro, N.S., 1883; Little Fox River, Gaspé, Que., 1882; near Belleville, Hastings Co., Ont., 1868; in woods at Banff and Morley, Rocky Mountains; along the Blackwater River, B.C. (*Macoun.*) Northwest coast of America. (*Herb. Hooker.*)

Var. **conspicua,** (SCHÆR.) NYL.

Quite common in woods, chiefly on earth on rocks.

On earth, Leading Tickle, Newfoundland. (*Waghorne.*) Along the Tobique River, N.B. (*G. U. Hay.*) Along Jupiter River, Anticosti, Que.; Gaspé Basin and Mount Albert, Gaspé Co., Que.; along the Nipigon River, Ont.; in woods, Duck Mountain, Man.; in woods at Donald, Columbia River, B.C. (*Macoun.*)

298. **C. Papillaria,** (EHRH.) HOFFM.

On earth at Truro, N.S., June 12th, 1883. (*Macoun.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

299. **C. cenotea,** (ACH.) SCHÆR.

On rotten logs and on earth in woods.

M'Iver's Cove and Middle Arm, Newfoundland. (*Waghorne.*) On rotten logs at Baddeck, Cape Breton Island N.S., July 9th, 1898; on logs in woods at Banff, Rocky Mountains; in woods at Donald and Deer Park on the Columbia River, B.C.; on rocks near Victoria, Vancouver Island. (*Macoun.*) Island in Cross Sound, Alaska; Mr. Willey doubtfully refers here forms from Cook's Inlet and Sitka. (*Rothrock.*)

300. **C. squamosa,** HOFFM.

On earth, mossy rocks and old logs in woods.

Greenland. (*Arct. Man.*) On rocks at Nain, Labrador. (*Dr. R. Bell.*) On earth, Clearwater Lake, Labrador. (*A. P. Low.*) Forteau Bay and L'Anse au Mort, Labrador; Cook's Brook, Coal River, Grand Lake, Bay of Islands, Alfrey Beach, Meadows and Wild Cove, Newfoundland; various forms collected. (*Waghorne.*) On earth, Tobique River, N.B. (*G. U. Hay.*) North shore of Lake Superior. (*Agassiz.*) Lake Winnipeg and north-west coast. (*Herb. Hooker.*) On rocks at the Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898; on rocks at Halifax, N.S.; along the Ste. Anne des Monts River, Gaspé Co., Que.; on old pine stumps at Britannia, six miles west of Ottawa, Ont.; on earth, Algonquin Park, Ont.; June, 1900; on earth at Sudbury Junction and Lake Nipigon, and on rocks north shore of Lake Superior; on rocks at Hastings, B.C., and in the vicinity of Victoria, Vancouver Island. (*Macoun.*) On mountains east of Adam's Lake, B.C; on Texada and Hansen islands, and at Blackwater River and Knox Bay, Gulf of Georgia, B.C. (*Dr. G.M Dawson.*) Attu Island, Behring Sea, 1891. (*J. M. Macoun.*) At Warm Springs, Sitka, Alaska. (*Rothrock.*) Sheep Creek, Juneau, Alaska; also at Nanaimo, Vancouver Island. (*Miss G. Cooley.*)

301. **C. delicata,** (EHRH.) FLOERK.

On decaying wood along Ste. Anne des Monts River, Gaspé Co., Que.; also on pine roots at Wooler, Ont., Oct. 17th, 1893; on rotten stumps and logs at Britannia, Stittsville, Hull and Buckingham, near Ottawa, Ont. (*Macoun.*)

302. **C. cæspiticia,** (PERS.) FLOERK.

On boulders, Big Intervale, Margaree, Cape Breton Island, N.S., July 16th, 1898. (*Macoun.*)

303. **C. furcata,** (HUDS.) FR. var. **crispata,** FLOERK.

On earth, quite common.

Greenland. (*Arct. Man.*) Arctic America and Rocky Mountains. (*Herb. Hooker.*) On earth, Eagle River, Sandwich Bay and Indian Harbour, Labrador, also Bay of Exploits, Newfoundland. (*Waghorne.*) Newfoundland. (*Despreaux.*) Along the

Tobique River, N.B. (*G. U. Hay.*) On earth, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) Common on earth at Baddeck, Englishtown and Margaree, Cape Breton Island, N.S., July, 1898; on Mount Albert, Gaspé Co., Que.; on earth at Britannia, Rockcliffe Park, near Ottawa, Ont., and Hull, Que.; in woods near Belleville, Hastings Co., Ont.; on earth, Algonquin Park, Ont., June, 1900; on earth, northeast coast of Lake Superior and shores of Lake Nipigon; on earth, Red Deer River, Porcupine Mountains, Man.; on House Mountain, near Lesser Slave Lake, Atha., 1872; at Pass Creek, Columbia River, B.C.; along Bragg's Creek, near the Elbow divide, Rocky Mountains; on old logs, Victoria, Vancouver Island, and Salt Spring Island, Gulf of Georgia. (*Macoun.*) On Harbledon, Texada and Thurlow islands, Gulf of Georgia. (*Dr. G.M. Dawson.*)

Var. **racemosa,** FLOERK.

Greenland. (*Arct. Man.*) Lark Harbor and River Head, Newfoundland. (*Waghorne.*) On earth along Tobique River, N.B. (*G. U. Hay.*) On earth, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On earth along the River Rouge, Argenteuil Co., Que. (*D'Urban.*) On gravel below the whirlpool, Niagara Falls, Ont., 1895. (*R. Cameron.*) On earth at Baddeck, Cape Breton Island, N.S., July, 1898; on earth at Truro, N.S.; at Rockcliffe Park, and in McKay's bush, Ottawa, Ont.; in damp woods at Belleville, Hastings Co., Ont.; on earth in woods, Queenston Heights, Ont., May 9th, 1901; on rocks, Algonquin Park, Ont., June, 1900; at Hastings, B.C., and along the Burnside Road, Victoria, Vancouver Island. (*Macoun.*) Hansen Island, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*)

Var. **subulata,** FLOERK.

Greenland. (*Arct. Man.*) Labrador or Newfoundland, with vars. *squamulosa*, Schr., and *adspersa*, Fl. (*Waghorne* fide *Eckfeldt.*) On earth along the Tobique River, N.B. (*G. U. Hay.*) On rocks, Lake Nipigon (this is a doubtful specimen); not uncommon on Sable Island, N.S., July, 1897; on rocks, Hastings, B.C.; on rocks near Victoria and at Comox, Vancouver Island. (*Macoun.*) Henslow and Hanson islands, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*) St. Paul and St. George islands, Behring Sea. (*J. M. Macoun.*)

Var. **pungens**, FRIES.

Greenland. (*Arct. Man.*) On rocks at Margaree, Cape Breton Island, N.S., July 20th, 1898; on earth at Belleville, Ont. (*Macoun.*) Earltown Lakes, N.S., Aug. 10th, 1883. (*Dr. A. McKay.*) North shore of Lake Superior. (*Agassiz.*)

304. **C. rangiferina,** (LINN.) HOFFM.

On earth in woods, very common.

Greenland. (*Arct. Man.*) On Baffin Land, north of Hudson Strait, Aug., 1897; at Nain, coast of Labrador. (*Dr. R. Bell.*) On earth, Clearwater Lake, Labrador, 1896. (*A. P. Low.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On earth in the Barren Grounds, Lat. 61°, Long. 104°, W.; Parry's Falls, Great Slave Lake, May 15th, 1900. (*J. W. Tyrrell.*) On earth, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) In woods along the River Rouge, Argenteuil Co., Que, (*D'Urban.*) On dry grounds, Credit Forks, Ont. (*Thos. Walker.*) On the ground at Edmonton, Ont. (*James White.*) On earth, Sable Island, N.S., July, 1899; on earth at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898; vicinity of Ottawa, and at Belleville, Ont.; on earth in woods, Queenston Heights, Ont., May 9th, 1901; on earth and rocks, Algonquin Park, June, 1900; in sandy woods, Chalk River, Ont,; on rocks at Nipigon River, Ont.; on earth, Thunder Bay, Lake Superior; Deer Park, Columbia River, B.C.; at Burrard Inlet, B.C. (*Macoun.*) On earth on rocks, Kingston Mills, Ont., Sept. 23rd, 1901; Chilliwack Valley, B.C.; St. George and St. Paul islands, Behring Sea. (*J. M. Macoun.*) Common in Alaska. (*Rothrock.*) Salmon Creek and Sheep Creek, near Juneau, Alaska. (*Miss G. Cooley.*) Alaska. (*Turner.*)

305. **C. sylvatica,** LINN.

Quite common in woods, especially westward.

Greenland. (*Arct. Man.*) Baffin Land, north of Hudson Strait, and at Nain, coast of Labrador. (*Dr. R. Bell.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Near Fort Norman, Mackenzie River, 1892. (*Miss E. Taylor.*) On earth, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On earth, Sable Island, N.S., July, 1899; in woods at Margaree, Cape Breton Island, N.S., 1898; at Chalk River and Belleville, Ont.; on earth

and rocks, Algonquin Park, Ont., July, 1900; in woods, Duck Mountain, Man.; common in Bow River Pass and at Banff, Rocky Mountains ; on earth along Jumping Pound Creek, and on Moose Mountain, Rocky Mountains, alt. 6,500 feet; along the Telegraph Trail, B.C., 1875 ; on earth, Roger's Pass, Rocky Mountains ; at Deer Park, Columbia River, B.C.; Burrard Inlet, B.C.; on rocks, Parson's Mountain, Victoria, and on Mount Benson, Nanaimo, Vancouver Island. (*Macoun.*) Hanson Island, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*) Cape Vancouver, Behring Sea ; St. George Island, Behring Sea. (*J. M. Macoun.*) Salmon Creek and Sheep Creek, Juneau, Alaska. (*Miss G. Cooley.*) Alaska. (*Turner.*)

Var. **alpestris,** LINN.

Rather common in dark, cool woods.

On rocks, at Nain, coast of Labrador. (*Dr. R. Bell.*) On earth, Clearwater Lake, 1896. (*A. P. Low.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Parry's Falls, Great Slave Lake, May 15th, 1900. (*J. W. Tyrrell.*) On earth, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) Stony Lake, Peterborough Co., Ont. (*Thos. Walker.*) On earth, east end of Sable Island, N.S., Aug., 1899 ; on earth at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898 ; on earth at Truro, N.S.; on Mount Albert, Gaspé Co., Que.; on rotten stumps at Britannia, near Ottawa, Ont.; on rocks in woods, Algonquin Park, Ont., July, 1900; northeast coast of Lake Superior ; on Duck Mountain, Man.; on rocks in woods, Banff, Rocky Mountains ; at McLeod's Lake, northern British Columbia, 1875. (*Macoun.*) St. Paul Island, Behring Sea, July, 1897. (*J. M. Macoun.*)

306. **C. Botrytis,** (HAG.) HOFFM.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On old logs, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On old logs along Bragg's Creek, Elbow River, Rocky Mountains, July 9th, 1897 ; on old pine logs, Lake Nipissing, Ont., May 29th, 1884 ; on rotten pine wood, northern British Columbia, June, 1875. (*Macoun.*)

307. **C. carneola,** FRIES.

On earth in Greenland, 1831. *Fries.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

Var. **cyanipes**, SOMMERF.

Greenland. (*Arct. Man.*) Newfoundland. (*Despreaux.*) Pinware River, Labrador. (*Waghorne.*)

308. **C. amaurocræa,** (FLŒRKE) SCHÆR.

Greenland. (*Arct. Man.*) On stones, Battle River, L'Anse au Loup, and L'Anse au Mort, Labrador. (*Waghorne.*) On earth, Arctic America. (*Richardson.*) Newfoundland. (*Despreaux.*) North shore of Lake Superior. (*Agassiz.*) On rocks at Lake Nipigon; also on earth at Otter Head, Lake Superior; vicinity of Victoria, Vancouver Island, 1875. (*Macoun.*) Along Peel's River, Mackenzie River, July 15th, 1892. (*Miss E. Taylor.*)

309. **C. uncialis,** (LINN.) FR.

East of Ste. Modeste, Labrador. (*Waghorne.*) On earth, Arctic America, (*Richardson.*) Western Greenland. (*Warming & Holm.*) Chilliwack Valley, B.C.; on St. George Island, Behring Sea, Aug., 1891. (*J. M. Macoun.*) Sitka and Kotzebue Sound, Alaska. (*Turner.*)

Var. **adunca,** FR.

On earth throughout the continent.

L'Anse au Loup and Blanc Sablon, Labrador. (*Waghorne.* On earth, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On earth in woods, Baddeck and Half-Way Brook, Cape Breton Island, N.S.; Mount Albert, Gaspé Co., Que.; on earth at Chelsea and King's Mountain, Que.; in pine woods at Chalk River and Belleville, Ont.; on rocks, Algonquin Park, Ont., July, 1900; north shore of Lake Superior; on earth on rocks, Pass Creek, Columbia River, B.C.; on earth on rocks at Victoria, Comox, and on Mount Benson, Nanaimo, Vancouver Island. (*Macoun.*)

Var. **Caroliniana,** TUCKERM.

Near Blanc Sablon, Labrador. (*Waghorne.*)

Var. **turgescens,** FR.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) St. Paul Island, Behring Sea, June 28th, 1897. (*J. M. Macoun.*)

310. **C. Boryi,** TUCKERM.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On earth near the sea, Newfoundland. (*Despreaux.*) Coast of Labrador. (*M. W. A. Stearns.*) On sandy earth, Sable Island, N.S., July, 1899; Salt Lake, Anticosti, August, 1883. (*Macoun.*)

311. **C. chlorophæa,** FLŒRKE.

L'Anse au Mort and East Ste. Modeste, Labrador. (*Waghorne.*)

312. **C. Cornucopioides,** (LINN.) FR.

On earth in sterile soils, quite common northward.

West Greenland. (*Warming.*) Arctic America. (*Richardson.*) Clearwater Lake, Labrador, 1896. (*A. P. Low.*) Fox Cove and East Ste. Modeste, Labrador. (*Waghorne.*) On the Barren Grounds, Lat. 61°, Long. 104°, W. (*J. W. Tyrrell.*) In woods along the Rouge River, Argenteuil Co., Que. (*D'Urban.*) On Mount Albert, Gaspé Co., Que.; on earth, North Hastings, Ont.; north shore of Lake Superior and at Lake Nipigon; on House Mountain, near Little Slave Lake, Atha., 1872; along Jumping Pound Creek, Rocky Mountains, June, 1897; on earth at Hector, Rocky Mountains; on rocks, Deer Park and Pass Creek, Columbia River, B.C.; on rocks at Hastings, Burrard Inlet, B.C.; and at Comox, Vancouver Island. (*Macoun.*) Johnson's Strait, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*) St. Paul, St. George and Unalaska islands, Behring Sea. (*J. M. Macoun.*) Port Althorp, Alaska, (*Rothrock.*)

313. **C. bellidiflora,** (ACH.) SCHÆR.

On earth and on rocks, chiefly westward.

Greenland. (*Flœrke.*) West Greenland. (*Warming.*) Seal Lake, Labrador, July, 1896. (*A. P. Low.*) L'Anse au Mort, Labrador. (*Waghorne.*) Coast of Labrador. (*Wenck.*) Newfoundland. (*Despreaux.*) On rocks, vicinity of Victoria, Mount Benson, near Nanaimo, Vancouver Island, and on Salt Spring Island, Gulf of Georgia; also at Hastings, Burrard Inlet, B.C. (*Macoun.*) On rocks, Thurlow Island, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*) Chilliwack Valley, B.C., 1901; St. George and St. Paul islands, Behring Sea; Middleton Island, Port Etches and Sitka, Alaska. (*J. M. Macoun.*)

314. **C. deformis,** (LINN.) HOFFM.

Greenland. (*Arct. Man.*) Eagle River and Sandwich Bay, Labrador. (*Waghorne.*) Clearwater Lake, Labrador, 1896. (*A. P. Low.*) Newfoundland. (*Despreaux.*) Barren Grounds, Lat. 61°, Long. 104°, W. (*J. W. Tyrrell.*) On earth, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On earth in swamps at Port Arthur, Lake Superior. (*Thos. Walker.*) North shore of Lake Superior. (*Agassiz.*) On earth, old land, Sable Island, N.S., July, 1899; on logs at Margaree, Cape Breton Island, N.S., July, 1898; on earth, Cape Rosier, Gaspé Co., Que.; Lake Flora, Hull, and at Stittsville, Chelsea and Britannia near Ottawa, Ont.; on earth and rotten wood, Algonquin Park, Ont., June, 1900; along Lake Nipigon, Ont.; on earth, Red Deer River, Porcupine Mountains, Man.; in woods at Banff, Rocky Mountains; along Jumping Pound Creek, Rocky Mountains, 1897; at Donald, Columbia River, B.C.; along the Telegraph Trail and Blackwater River; northern British Columbia; Burnside Road, near Victoria, Vancouver Island, 1893. (*Macoun.*) Mountains east of Adam's Lake, B.C.; Thurlow Island, Gulf of Georgia. These specimens are doubtful. (*Dr. G. M. Dawson.*) Chilliwack Valley, B.C. (*J. M. Macoun.*) Kotzebue Sound, Alaska (*Turner.*)

315. **C. digitata,** (LINN.) HOFFM.

On earth and rotten wood.

Greenland. (*Vahl.*) Canada. (*A. T. Drummond.*) Eagle River, Labrador. (*Waghorne.*) On old pine stumps at Britannia, Ont., and west of Hull, Que.; on the bases of pine stumps, near Wooler, Ont.; on old logs, Island Lake, Algonquin Park, Ont., July, 1900; on old logs, Bragg's Creek, Elbow River, Rocky Mountains, 1897. (*Macoun.*) Old Sitka, Alaska. (*Rothrock.*)

316. **C. macilenta,** (EHRH.) HOFFM.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On rotten wood at Victoria, 1887, and along the Burnside road near Esquimault, Vancouver Island, 1893. (*Macoun.*) Loring, Alaska. (*Miss G. Cooley.*)

317. **C. pulchella,** SCHW.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

318. **C. cristatella,** TUCKERM.

On earth and dead wood ; common in the east. With us it is generally found on old pine logs and stumps.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On old land, Sable Island, N.S., July, 1899 ; on logs and stumps at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898 ; on old logs at Truro, N.S.; on earth in woods, Rustico Bay, Prince Edward Island ; on earth, Cape Rosier, Gaspé Co., Que.; on dead wood, common at Ottawa, Belleville, Wooler and Campbellford, Ont.; on earth and stumps, Algonquin Park, Ont.; June, 1900 ; on earth, northeast coast of Lake Superior. (*Macoun.*) Lake region, N.B.; also along the Tobique River, B.C. (*G. U. Hay.*) On old logs, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On rotten roots at Edmonton, Ont. (*James White.*) On old logs, London, Ont. (*J. Dearness.*) On old wood at Credit Forks, Ont.; and at Port Arthur, Lake Superior. (*Th s. Walker.*)

319. **C. Flœrkeana,** FR.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

320. **C. multibrachiata,** (FLŒRKE) ECKFELDT.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

321. **ochrochlora,** FLŒRKE.

Birchy Cove and John's Beach, Newfoundland. (*Waghorne.*)

322. **C. pycnotheliza,** NYL.

Wood's Island and Lake Harbour, Newfoundland. (*Waghorne.*)

323. **C. subcariosa,** NYL.

Grand Lake, Newfoundland. (*Waghorne.*)

34. THAMNOLIA, (Ach.) Mass.

324. **T. vermicularis,** (SW.) SCHÆR.

On earth in northern and alpine districts.

Greenland. (*Arct. Man.*) Battle Harbour, Labrador and Newfoundland. (*Waghorne.*) Arctic America. (*Richardson.*)

Mansfield Island, Hudson Strait. (*Dr. R. Bell.*) Amongst moss, Mount Albert, Gaspé Co., Que.; Bow River Pass and Sulphur Mountain, Banff ; at Hector and MooseMountain, Rocky Mountains ; on rocks near Victoria, on Mount Benson near Nanaimo, and on Mount Arrowsmith, Vancouver Island. (*Macoun.*) Port E ches, Alaska, and Unalaska, Behring Sea. (*J. M. Macoun.*)

35. BÆOMYCES, Pers., DC.

325. B. placophyllus, Ach.

On earth along the Gaspé Coast, below St. Anne des Monts River, Que., Aug. 14th, 1882. (*Macoun.*)

326. B. Byssoides, (Linn.) Schær.

On earth and rocks on elevated regions.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On earth at Baddeck, Cape Breton Island, N.S., July, 1898 ; along the Madeline River, Gaspé Co., Que.; on rocks on islands in Lake Nipigon ; on earth on the prairie at Old Wives Creek, Assa., May, 1895 ; also on rocks at Hector, Rocky Mountains. (*Macoun.*)

327. B. roseus, Pers.

On sterile earth, common eastward.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Bass River, Kent Co., N.B. (*Prof. Fowler.*) Cape Rosier, Gaspé Co., Que.; at Truro, N.S.; Brackley Point, Prince Edward Island ; abundant at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898. (*Macoun.*)

328. B. æruginosus, (Scop.) DC.

Rotten wood and moss in cool forests ; common.

Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) Clearwater Lake, Labrador, July, 1896. (*A. P. Low.*) On rotten wood, L'Anse au Mort, Labrador. (*Waghorne.*) On moss in the Barren Grounds, Lat. 61°, Long. 104′, W. (*J. W. Tyrrell.*) On moss, Canaan Forks, Queen's Co., N.B. (*J Moser.*) Spence's Lake, St. John, N.B. (*G. U. Hay.*) North shore of Lake Superior. (*Agassiz.*) On old logs and moss, common on Cape Breton Island, N.S.; on dead wood at Truro, N.S.; on earth at Salt Lake,

Anticosti ; on old logs, Ste. Anne des Monts River, Gaspé Co., Que.; on old pine logs at Meech's Lake and Buckingham, Que.; on wood, Lake Nipigon and on moss northeast shore of Lake Superior; along Peace River, Lat. 56°, 1872 ; on old logs at Banff and Hector, Rocky Mountains ; at McLeod's Lake, B.C.; on logs, Bragg's Creek and on Elbow Divide, Rocky Mountains, 1897, on dead wood, Parson's Mountain, Victoria, Vancouver Island. (*Macoun.*) Mountains east of Adam's Lake, B.C. ; on Thurlow Island, Gulf of Georgia, B.C. (*D . G. M. Dawson.*) West coast of British Columbia to Sitka. (*Hall.*) Port Etches and Sitka Island, Alaska. (*J. M. Macoun.*) Sitka and Port Althorp, Alaska. (*Rothrock.*) Loring and Salmon Creek near Juneau, Alaska. (*Miss G. Cooley.*)

36. BIATORA, Fries.

329. **B. atro-rufa,** (Dicks.) Fr.

On earth in alpine districts.

Greenland. (*Eberlin.*) Tadousac, Que. (*A. T. Drummond.*) On earth on Moose Mountain, Rocky Mountains, July, 1897, alt. 6,000 feet ; on rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C.; on earth, summit of Mount Arrowsmith, Vancouver Island. (*Macoun.*)

330. **B. lurida,** (Sw.) Fr.

On earth on Moose Mountain, Rocky Mountains, July 3rd, 1897, alt. 6,500 feet. (*Macoun.*)

331. **B. globifera,** (Ach.) Fr.

On calcareous earth, Greenland. (*Vahl.*)

332. **B. rubiformis,** (Vahl.) Fr.

On earth in Greenland and elsewhere in Arctic America. (*Th. Fries.*) On earth, Moose Mountain, Rocky Mountains, June 30th, 1897, alt. 6,500 feet. (*Macoun.*)

333. **B. rufo-nigra,** Tuckerm.

On rocks, north shore of Lake Superior. (*Agassiz.*) On rocks along Lake Nipigon, northeast coast of Lake Superior, July, 27th,

1869; at Fort Chipweyan and in northern British Columbia. (*Macoun.*) South Fowl Lake, boundary between Ontario and Minnesota, June 26th, 1897. *Fink.*)

334. **B. testacea,** HOFFM.

On the highest bluff at the Police Station, Wood Mountain, Assa., June 10th, 1895; on earth along Jumping Pound Creek, Rocky Mountains, June 14th, 1897. (*Macoun.*)

335. **B. Russellii,** TUCKERM.

On rocks, Blackwater River, northern British Columbia, June 11th, 1875; on rocks, Deer Park, Columbia River, B.C. (*Macoun.*)

336. **B. scotopholis,** TUCKERM.

On earth at Morley, Bow River valley, Rocky Mountains, June 13th, 1885. (*Macoun.*)

337. **B. decipiens,** (EHRH.) FR.

On earth in calcareous districts.

Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) Salt Lake, Anticosti, Que.; on earth at Pheasant Mountain, Assa.; on earth along Old Wives' Creek and south of Wood Mountain, Assa.; on earth Moose Mountain, Rocky Mountains, June, 1897; at Câche Creek and Spence's Bridge, B.C. (*Macoun.*)

338. **B. icterica,** MONT.

On earth at Revelstoke, on the Columbia River, B.C., May 4th, 1890. (*Macoun.*)

339. **B. coarctata,** (SM., NYL.) TUCKERM.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On limestone rocks at Britannia, 6 miles west of Ottawa, Ont., April 20th, 1895. (*Macoun.*)

340. **B. granulosa,** (EHRH.) POETSCH.

On turfy and sandy soil and on dead mosses and dead wood.

Arctic America. (*Richardson.*) On earth, White Bear River, Newfoundland. (*Waghorne.*) Quebec. (*A. T. Drummond.*) On

earth, Half Way Brook, Cape Breton Island, N.S., July, 1898 ; on earth, coast of Gaspé Co., Que.; on old pine logs and stumps at Britannia, near Ottawa, Ont., and at King's Mountain, near Chelsea, Que.; on earth on rocks, Algonquin Park, Ont., June, 1900 ; along Nipigon River and east coast of Lake Superior ; on earth in woods at Banff, Rocky Mountains ; on earth on rocks at Lake Mara, Sicamous, B.C., July, 1889 ; on Mount Benson, near Nanaimo, Vancouver Island. (*Macoun.*) Rocky Mountains. (*Bourgeau.*) Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

341. **B. flexuosa,** FRIES.

On dead wood.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On old cedar rails at Port Rowan, close to Lake Erie, July 24th, 1892 ; on dead pine wood, Nipigon River, Ont. (*Macoun.*)

342. **B. viridescens,** (SCHRAD.) FR.

On dead wood, Big Intervale, Margaree, Cape Breton Island, N.S., July 16th, 1898. (*Macoun.*)

343. **B. peliaspis,** TUCKERM.

On living bark and dead wood of conifers. (*Tuckerman.*) On living bark of balsam fir, Gaspé Basin, Gaspé Co., Que., Aug. 11th, 1882. (*Macoun.*)

344. **B. russula,** (ACH.) MONT.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

345. **B. cinnabarina,** (SOMMERF.) FR.

On shrubs, Greenland. (*Vahl.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On spruce bark and twigs at Cedar Hill, Victoria, Vancouver Island, May 14th, 1887. (*Macoun.*) Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

346. **B. cuprea,** (SOMMERF.) FR.

On the earth in alpine regions.

Greenland. (*Vahl.* Islands of Behring Strait. (*Wright.*)

347. **B. vernalis,** (Linn.) Fr.

Upon mosses and bark ; more rarely on dead wood.

Greenland. (*Arct. Man*) Arctic America. (*Richardson.*) L'Anse au Mort, Labrador ; on moss, Shoal Point, Chimney Cove and Lark Harbour, Newfoundland. (*Waghorne.*) On earth on rocks, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) North shore of Lake Superior. (*Agassiz.*) On moss on rocks and on spruce trees at Margaree, Cape Breton Island, N.S., July, 1898 ; on moss along the Ste. Anne des Monts River, Gaspé Co., Que.; upon moss at Sudbury Junction, Ont.; on bark of trees, Red Deer River, Porcupine Mountains, Man.; on earth, Jumping Pound Creek and on Moose Mountain, Rocky Mountains, June, 1897. (*Macoun.*)

Var. **helvola,** Koerb.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On bark of spruce trees, Salt Lake, Anticosti, Que.; Aug. 10th, 1883; on bark of Douglas fir, Hastings, Burrard Inlet, B.C., April 10th, 1889. (*Macoun.*)

348. **B. sanguineo-atra,** (Fr.) Tuckerm.

On dead mosses at the base of trees and on earth.

Middle Arm, Newfoundland. (*Waghorne.*) Greenland. (*Arct. Man.*) Quebec. (*A. T. Drummond.*) On moss, Salt Lake, Anticosti, Que.; on earth, Brackley Point, Prince Edward Island ; on bark of balsam and spruce at Baddeck, Cape Breton Island, N.S., July 9th, 1898 ; on moss at the base of trees in Dow's swamp and other places at Ottawa, Ont.; at Belleville, Hastings Co., Ont.; on earth, Lake Nipissing, Ont.; on earth near Lesser Slave Lake, Atha.; on earth along Bragg's Creek, Rocky Mountains, Alta., June, 1897. (*Macoun.*) On logs, Old Sitka, Alaska. (*Rothrock.*)

349. **fuscorubens,** Nyl.

On rocks in company with *Biatora rupestris* at Middle Arm, Newfoundland. (*Waghorne.*)

350. **B. Berengeriana,** Th. Fr.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On earth along Ste. Anne des Monts River, Gaspé Co., Que., 1882 ;

on earth at Belleville, Hastings Co., Ont., 1882 ; on earth along Nipigon River, Ont., 1884 ; on earth along Jumping Pound Creek, on Moose Mountain and at Banff, Rocky Mountains ; on earth on rocks at Deer Park, Arrow Lakes, Columbia River, B.C., 1890. (*Macoun.*)

351. **B. rufo-fusca**, Anz.

Upon turfy earth in alpine districts.

Green and. (*Vahl.*) On earth and moss at Donald, Columbia River, B.C., July 6th, 1885. (*Macoun.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

352. **B. turgidula,** (Fr.) Nyl.

On the bark of coniferous trees and on dead wood.

Green and. (*Vahl.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

353. **B. rivulosa,** (Ach.) Fr.

On rocks.

Arctic America. (*Richardson.*) On bark of living beech trees at Ottawa, April 19th, 1898. (*Macoun.*) Labradot or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

354. **B. arcuatula,** (Arn.) Eckfeldt.

On rocks, Labrador or Newfoundland. Closely related to *B. rivulosa.* (*Waghorne* fide *Eckfeldt.*)

355. **B. leucophæa,** Floerke.

Granite rocks in mountainous and arctic regions. Arctic America. (*Tuckerm.*)

356. **B. scrupulosa,** Eckfeldt.

Labrador or Newfoundland. A well-marked species which seems to approach *B. Kochiana Hepp.* (*Waghorne* fide *Eckfeldt.*)

357. **B. albo-fuscescens,** (Nyl.) Eckfeldt.

On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

358. **B. mollis,** WAHL.

On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

359. **B. fuscescens,** (SOMMERF.) FRIES.

On the bark of young birch, and often trees and shrubs. (*Fries.*) Greenland. (*Vahl.*)

360. **B. Paddensis,** TUCKERM.

On maple and beech bark on the mountain side, Big Intervale, Margaree, Cape Breton Island, N.S., July 22nd, 1898. (*Macoun.*)

361. **B. Nylanderi,** ANZ.

On old staging at Frenchman's Cove, Newfoundland. (*Waghorne.*)

362. **B. Tornoensis,** (NYL.) TH. FR.

On various trees and shrubs in Europe. Also in Arctic America. (*Fries.*) Greenland. (*Vahl.*) On vine maple (*Acer circinatum*) at Hastings, B.C., April 14th, 1889. (*Macoun.*)

363. **B. uliginosa,** (SCHRAD.) FR.

On turfy earth, sand, charred pine stumps, and rotting wood. Greenland. (*Arct. Man.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On peaty earth, Salt Lake, Anticosti, Que.; on earth, Algonquin Park, Ont., July, 1900; on earth on rocks, Deer Park, Columbia River, B.C. (*Macoun.*)

364. **B. varians,** (ACH.) TUCKERM.

On bark, very common; also on dead wood.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On alder bark, Cove Head, Prince Edward Island; very common on bark of *Alnus incana* at Baddeck, Cape Breton Island, N.S., July, 1898; on maple bark at Casselman near Ottawa, Ont.; on blue beech at Aylmer, Que.; on poplar bark near Wooler, Ont.; on young pine trees at Belleville, Hastings Co., Ont.; on maple twigs near Hastings, Burrard Inlet, B.C.; and on poplar trees, Sea's farm, Victoria, Vancouver Island. (*Macoun.*)

365. **B. lucida,** (Ach.) Fr.

On rocks in shaded places, on the bare roots of trees, and on dead wood. (*Tuckerman.*) Arctic America. (*Richardson.*)

366. **B. flavido-livens,** Tuckerm. (*In litteris.*)

On bark of Balsam fir at Brackley Point, Prince Edward Island, July 5th, 1888. (*Macoun.*)

367. **B. oxyspora,** (Tul.) Tuckerm.

On *Parmelia Borreri* in McKay's woods, Ottawa, Ont., and on the same species at Lake Nipigon, Ont., July 14th, 1884. (*Macoun.*)

368. **B. mixta,** Fr.

On living bark and also less commonly on dead wood. (*Tuckerman.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On bark of ash and other trees, Truro, N.S.; on young poplars, Sea's farm, near Victoria, Vancouver Island; on spruce bark in woods at Baddeck, Cape Breton Island, N.S., July 29th, 1898. (*Macoun.*) On bark of trees, London, Ont. (*A. T. Drummond.*)

369. **B. atropurpurea,** (Mass.) Hepp.

On bark, also on dead wood. (*Tuckerman.*) On bark of dead wood, Middle Arm and Coal River, Newfoundland. (*Waghorne.*) On living beech trees at Belleville, Hastings Co., Ont., April 20th, 1879; on beech bark near Hemlock Lake, Ottawa, Ont., September 6th, 1891. (*Macoun.*)

370. **B. Laureri,** (Hepp.) Tuckerm.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On beech trees at Margaree, Cape Breton Island, N.S., July, 1898; on beech bark, both living and dead, at Ottawa, Ont., common; abundant on beech trees around St. Catharines and Niagara Falls, Ont., May, 1901. (*Macoun.*) Quebec. (*A. T. Drummond.*) On bark of trees, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On beech trees at Edmonton, Ont. (*James White.*) On beech bark at Credit Forks, Ont. (*Thos. Walker.*) Alaska. (*Hall.*)

371. **B. cyrtella,** (Ach., Nyl.) Tuckerm.

On hickory bark (*Carya alba*) at Belleville, Hastings Co., Ont.; on bark of *Alnus incana* near the Hogsback, Rideau River, May 7th, 1897; on poplar trees, Old Wives' Creek, Assa., May 30th, 1895; on alders near Hastings, Burrard Inlet, B.C., 1889. (*Macoun.*)

372. **B. Heerii,** Hepp.

Parasitic on *Solorina saccata.*
Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

373. **B. stereocaulorum,** (Th. Fr.) Eckfeldt.

Parasitic on *Stereocaulon alpinum.*
Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

374. **B. globulosa,** (Floerke.) Hepp.

On dead wood of conifers. (*Tuckerman.*) On poplar bark in Stewart's bush, near Ottawa, Ont., April 13th, 1895; on dead pine wood, Telegraph Trail, northern British Columbia, June 12th, 1875. (*Macoun.*) On bark, Nagai Island, Shumigan Group, Alaska, 1892. (*J. M. Macoun.*)

375. **B. micrococca,** Koerb.

On old cedar rails (*Thuya occidentalis*) west of the old toll-gate, Aylmer road, Hull, Que., Oct. 6th, 1898. (*Macoun.*)

376. **B. sphæroides,** (Dicks.) Tuckerm.

Upon turfy earth and mosses on rocks, in high northern regions. (*Tuckerman.*) On moss, St. John's beach, Newfoundland. (*Waghorne.*) On mosses in woods at Ottawa, Ont.; bases of trees, Carleton Place, Ont.; on the earth at the base of trees, Algonquin Park, Ont., June, 1900; on moss, northeast coast of Lake Superior; on moss at the base of trees, Red Deer River, Porcupine Mountains, Man.; on rocks, Tunnel Mountain, Banff, on rocks at Hector; on earth al ng Jumping Pound Creek and on Mount Forget-me-not, Rocky Mountains, 1897; along the Blackwater River, northern British Columbia, 1875. (*Macoun.*) Islands of Behring Strait. (*Wright.*)

377. **B. hypnophila,** (TURN.) TUCKERM.

On mosses, stones, earth, dead wood and living bark. (*Tuckerman.*) Greenland. (*Vahl.*) On moss, Middle Arm, St. John's beach and Pleasant Cove, Newfoundland. (*Waghorne.*) On dead wood, Ottawa, Ont. (*A. T. Drummond.*) On moss on rocks, bark and fence-rails at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898; on dead wood and moss, Gaspé coast, Que.; on moss on rocks and on old rails at Ottawa, Ont.; on the bases of trees, Seymour West, Northumberland Co., Ont.; on moss at the base of trees, Algonquin Park, Ont., June, 1900; on dead bark, Lake Nipigon, and on moss, northeast coast of Lake Superior; on moss along Lake Winnipego is, Man.; on earth at Morley and on moss at Banff, Rocky Mountains; on bases of trees at Revelstoke, Columbia River, B.C. (*Macoun.*)

378. **B. verecundula,** (TH. FR.) TUCKERM.

Upon mosses, Grinnell Land, Arctic America. (*Th. Fries.*)

379. **B. artyta,** (ACH.) TUCKERM.

On earth in high northern regions. (*Tuckerman.*) On the ground, Goose Arm, Newfoundland. (*Waghorne.*) On earth on rocks, Lake Nipigon; on earth at Hector and Cathedral Mountain, Rocky Mountains. (*Macoun.*) Islands of Behring Strait. (*Wright.*)

380. **B. milliaria,** (FR.) TUCKERM.

On bark of old trees, Frenchman's Cove, Newfoundland. (*Waghorne.*) On earth in woods at Banff, July 11th, 1891; also on earth along Jumping Pound Creek, Rocky Mountains, June, 1897. (*Macoun.*) Shumigan group of islands, Alaska. (*Rothrock.*)

381. **B. melæna,** (NYL.) TUCKERM.

On bark of old logs, St. John's beach, Newfoundland. (*Waghorne.*) On old and charred cedar rails along the Richmond road near Ottawa, Ont., April 18th, 1896. (*Macoun.*)

382. **B. castanea,** HEPP.

Clearwater Lake, Labrador, July, 1896. (*A. P. Low.*) Greenland. (*Arct. Man.*) On earth at Morley, Bow River Pass, June

15th, 1885; and on earth, Moose Mountain, Rocky Mountains, July, 1897; on rocks at Deer Park, Columbia River, B.C. June, 1890. (*Macoun.*)

383. **B. rubella,** (EHRH.) RABENH.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Upon bark, Arctic America. (*Richardson.*) On bark of maple, basswood, beech, white cedar and blue beech at Ottawa, Ont.; on blue beech at Aylmer, Que.; white cedar, Seymour West, Northumberland Co., Ont.; common on bark, Algonquin Park, Ont., June, 1900; on bark at Niagara Falls, May, 1901. (*Macoun.*) On trees at London, Ont. (*A. T. Drummond.*)

384. **B. fusco-rubella,** (HOFFM.) TUCKERM.

On maple and ash bark at Ottawa, Ont.; on white pine at Belleville, Hastings Co., Ont.; on blue beech, Central Ontario Junction, Hastings Co., Ont.; and maple trees, Foster's flats, Niagara Falls, May, 1901. (*Macoun.*)

385. **B. suffusa,** FR.

On trees, London, Ont. (*A. T. Drummond.*) On elm bark, Edmonton, Ont. (*J. White.*) On maple, ash and basswood bark at Ottawa, Ont.; on maple bark at Belleville, Hastings Co., Ont.; on bark of trees, Algonquin Park, Ont., June, 1900. (*Macoun.*)

386. **B. Schweinitzii,** FR.

On trees, London, Ont. (*A. T. Drummond.*) On beech, cedar and spruce trees at Ottawa, Ont.; on maple and swamp ash bark at Belleville, Hastings Co.; on *Thuya occidentalis* bark, Algonquin Park, Ont., June, 1900; on cedar bark, Foster's flats, and on maple above Niagara Falls, Ont., May, 1901. (*Macoun.*)

387. **B. atrogrisea,** (DELIS.) HEPP.

On balsam trees at Brackley Point, Prince Edward Island; on bark of *Rhamnus Purshiana* at Comox, Vancouver Island, June 19th, 1893; on bark of small maples at Revelstoke, B.C. (*Macoun.*)

388. **B. inundata,** FR.

On rocks, Ballantyne Cove, Newfoundland. (*Waghorne.*)

389. **B. Friesiana,** HEPP.

On pieces of wood, Wild Cove, Newfoundland. (*Waghorne.*)

390. **B. effusa,** (SMITH) HEPP. var. **arceutina,** ACH.

On the bark of *Alnus rubra* at Comox, Vancouver Island, June 19th, 1893. (*Macoun.*)

391. **B. Beckhausii,** (KOERB.)

On old fence-rails west of the old toll-gate, Aylmer road, Hull, Que., Oct. 6th, 1898. (*Macoun.*)

392. **B. akompsa,** TUCKERM.

On *Ribes bracteosum* at Comox, Vancouver Island, June 19th, 1893. (*Macoun.*)

393. **B. muscorum,** (SW.) TUCKERM.

Greenland. (*Arct. Man.*) On earth, northeast coast of Newfoundland. (*Waghorne.*) Islands of Behring Strait. (*Wright.*)

394. **B. umbrina,** (ACH.) TUCKERM.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

395. **B. rupestris,** SCOP.

On stones, Middle Arm and Coal River, Newfoundland. (*Waghorne.*)

396. **B. chlorantha,** TUCKERM.

On the bark of white pine and spruce, North Bay, Lake Nipissing, May 31st, 1884; on bark of balsam fir, Algonquin Park, Ont., June, 1900. (*Macoun.*)

397. **B. moriformis,** (ACH.) TUCKERM.

On bark and dead wood, Lake Manitoba, and Lake Winnipegosis, Man., July 2nd, 1881. (*Macoun.*)

398. **B. funerea,** (SOMMERF.)

Urophora funerea (Sommerf.) Arn.

On rocks, Shoal Point and Rope Cove, Newfoundland. (*Waghorne.*)

399. **B. obscurella,** SOMMERF.

On bark at Siles Point and Little Harbour, Newfoundland. (*Waghorne.*)

400. **B. obscurata,** (SOMMERF.) ECKFELDT.

Greenland. (*Arct. Man.*) On rotten wood, Chimney Cove, Newfoundland. (*Waghorne.*)

401. **B. campestris,** FR.

On earth amongst moss, at Salt Lake, Anticosti, Que., Aug. 10th, 1883. (*Macoun.*)

402. **B. fuliginea,** ACH.

On bark of dead wood, Wood's Island, Newfoundland. (*Waghorne.*)

403. **B. Macounii,** ECKFELDT.

On granite boulders in Rockcliffe Park, Ottawa, Ont, and in woods west of Hull, Que., April 17th, 1898. (*Macoun.*)

404. **B. holomicra,** ANZ.

On pieces of dead wood at Meadows, Newfoundland. (*Waghorne.*)

405. **B. atrofusca,** FLOT.

On moss and dead bark, Frenchman's Cove, Newfoundland. (*Waghorne.*)

406. **B. pallida,** (ARN.) ECKFELDT.

Greenland. (*Arct. Man.*) On smooth bark, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

407. **B. cæsio-rufa,** (ACH.) ECKFELDT.

On smooth bark, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

37. HETEROTHECIUM, Flot.

408. **H. sanguinarium,** (LINN.) FLOT.

On bark, Clearwater Lake, Labrador, July 21st, 1896. (*A. P. Low.*) On bark at Coal River and Wild Cove, Newfoundland. (*Waghorne.*) On dead wood, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On pine bark, Tobique River, N.B. (*G. U. Hay.*) On trunks, dead wood, rocks and mosses, Tadousac, Que. (*A. T. Drummond.*) On various trees at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898; on spruce bark, Jupiter River, Anticosti, Que.; on spruce trees, Mount Albert, Gaspé Co., Que.; on bark of various trees and on rocks, Lake Nipigon; on bark of spruce trees, Current River, Thunder Bay, Lake Superior; on moss on rocks at Hector, Rocky Mountains. (*No. 510, Eckfeldt.*) On trees, Union Mines, near Comox, and near Victoria, Vancouver Island. (*Macoun.*) St. Paul and St. George islands, Behring Sea. (*J. M. Macoun.*)

409. **H. grossum,** (PERS.) TUCKERM.

On bark of dead wood, Wild Cove and Coal River, Newfoundland. (*Waghorne.*) On red cedar, Island of Grand Manan, N.B. (*Willey.*) On spruce trees along Jupiter River, Anticosti, Que.; on ash trees at the mouth of the Madeline River, Gaspé Co., Que.; on black ash trees at Baddeck, Cape Breton Island, N.S., July 9th, 1898. (*Macoun.*)

410. **H. pezizoideum,** (ACH.) FLOT.

Greenland. (*Stizenberger.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On spruce trees, Jupiter River, Anticosti, Que.; on bark of balsam fir at Truro, N.S.; on moss on the bases of trees at Carleton Place, Ont.; on earth and moss, Moose Mountain, Rocky Mountains, Alta, July, 1897, alt. 6,000 feet. (*Macoun.*) On mosses, islands of Behring Strait. (*Wright.*)

411. **H, fuscoluteum,** DICKS.

On rocks on earth, Unalaska Island, Behring Sea, June 4th. 1897. (*J. M. Macoun.*)

412. **H. alpinum,** Ach.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

413. **H. porphyrites,** Tuckerm.

On bark of trees, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

414. **H. leucoxanthum,** (Spreng.) Mass.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

38. LECIDEA, (Ach.) Tuckerm.

415. **L. candida,** (Web.) Ach.

Upon earth in the extreme north.
Arctic America. (*Richardson.*) Greenland. (*Vahl.*) On rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C. (*Macoun.*)

416. **L. cæruleo-nigricans,** (Lightf.) Schær.

On earth along the River St. Lawrence, Lat, 48°. (*Pringle.*) On earth on Moose Mountain, Rocky Mountains, July 3rd, 1897. alt. 6,500 feet. (*Macoun.*)

417. **L. cumulata,** Sommerf.

On the earth in alpine and arctic regions.
Greenland. (*Vahl.*)

418. **L. squalida,** (Schleich.) Ach.

On the earth in alpine and arctic regions.
Greenland. (*Vahl.*)

418*a*. **L. flavo-virescens,** (Dicks.) Borr.

Parasitic on the thallus of *Bœomyces Byssoides.*
Greenland. (*Arct. Man.*)

419. **L. pruinosa,** (Smith) Flot.

On rocks, Middle Greenland. (*Eberlin.*) On rocks, Birchy Cove and Irishtown, Newfoundland. (*Waghorne.*) On rocks along Jumping Pound Creek, Rocky Mountains, June, 1897; on

sandstone rocks, Wood Mountain, Assa., June, 1895; quite common on granite boulders at Ottawa, Ont., and Hull, Que. April, 1897. (*Macoun.*)

420. **L. lapicida,** (Ach.) Nyl.

Closely related to *L. pruinosa.*

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Greenland. (*Arct. Man.*) On limestone shingle near the Hogsback, by the Rideau River, near Ottawa, Ont., May 7th, 1897; quite common on limestone rocks everywhere around Ottawa; at Wood Mountain, Assa., June, 1895. (*Macoun.*)

421. **L. tessellata,** Floerke.

Granitic rocks. Greenland. (*Vahl.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Along the north shore of Lake Superior. (*Agassiz.*) On rocks along the South Saskatchewan River, Assa. (*Macoun.*)

422. **L. tessellina,** Tuckerm.

On various rocks. On boulders at Belleville, Hastings Co., Ont., Sept., 1878; along the Nipigon River, Lake Superior, July, 1884. (*Macoun.*)

423. **L. auriculata,** Th. Fr.

Granitic rocks, Greenland. (*Vahl.*) Arctic America. (*Fries.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

424. **L. polycarpa,** Fr.

On alpine and arctic rocks.

Labrador. (*Krempelhuber.*) Arctic America. (*Stizenberger.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On rocks, Deer Park, Columbia River, B.C., June, 1890. (*Macoun.*)

425. **L. variegata,** Fr.

On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

426. **L. pancœola,** Ach.

On granitic rocks, Greenland. (*Vahl.*) On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

427. **L. contigua,** Fr.

Greenland. (*Arct. Man.*) On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Granite rocks, along Ste. Anne des Monts River, Gaspé Co., Que.; on limestone rocks at Aylmer, Que., April 25, 1900. (*Macoun.*)

428. **L. speirea,** Nyl.

On rocks, north shore of Lake Superior. (*Agassiz.*).

429. **L. confluens,** Schær.

Granitic rocks in alpine and arctic regions.
Greenland. (*Vahl.*) Arctic America. (*Richardson.*)

430. **L. albocærulescens,** (Wulf.) Schær.

Granitic and arenaceous rocks.
Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On granitic rocks at Shannonville, Hastings Co., Ont.; on granitic rocks at Margaree, Cape Breton Island, N.S., July, 1898. (*Macoun.*)

Var. **flavocærulescens,** Schær.

On rocks in alpine and arctic regions.
Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On rocks along the Ste. Anne des Monts River, Gaspé Co., Que., Aug, 18th, 1882. (*Macoun.*)

431. **L. atro-brunnea,** (DC.) Schær.

On alpine and arctic granitic rocks.
Greenland. (*Vahl.*)

432. **L. fusco-atra,** (Linn. Fr.

Granitic rocks, alpine and arctic, as well as in the lower districts.
Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) Tadousac, St. Lawrence River, Que. (*A. T. Drummond.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

433. **L. tenebrosa,** FLOT.

On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

434. **L. fuscescens,** SOMMERF.

Greenland. (*Arct. Man.*) On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

435. **L. Dicksonii,** ACH.

On rocks, Sparrible Cove, Newfoundland. (*Waghorne.*)

436. **L. polygonia,** FLOT.

On rocks, Leading Tickle, Newfoundland. (*Waghorne.*)

437. **L. Armeniaca,** (DC.) FR.

Alpine and arctic granitic rocks,
Greenland. (*Vahl.*)

438. **L. aglæa,** SOMMERF.

Alpine and arctic granitic rocks.
Greenland. (*Vahl.*)

439. **L. amylacea,** ACH

Alpine rocks, containing lime.
Greenland. (*Vahl.*)

440. **L. enteroleuca,** FR.

On rocks and stones.

On stones, Rope Cove, Bay of Islands and Little Harbour, Newfoundland. (*Waghorne.*) Greenland. (*Arct. Man.*) On small pebbles at Baddeck, Cape Breton Island, N.S., July 29th, 1898; on small stones, summit of Mount Albert, Gaspé Co., Que., 1882; on small pebbles at Ottawa, Ont., April, 1900. (*Macoun.*)

Var. **æquata,** FLŒRKE.

On trap rocks, Grand Manan Island, N.B. *Willey.*

Var. **muscorum,** KOERB.

Chiefly on mosses in alpine and arctic regions.

Islands in Behring Strait. (*Wright.*) On moss at the bases ot trees, Salt Lake, Anticosti, Que.; on earth in woods at Banff, Rocky Mountains, 1891. (*Macoun.*)

Var. **achrista,** SOMMERF.

On trees and shrubs.

On bark of trees along Lake Winnipegosis, and on Moose Mountain, Man., July, 1880; on cherry bark at Old Wives' Creek, Assa., May, 1895 ; on poplar bark along Jumping Pound Creek, Rocky Mountains, June, 1897. (*Macoun.*)

Var. **pilularis,** DC.

On limestone rocks along the Rideau River near the Hogsback, May 7th, 1897 ; at Aylmer, Que., April, 1900. (*Macoun.*)

441. **L. vorticosa,** KOERB.

On alpine and arctic granitic rocks.

Arctic America. (*Fries.*)

442. **L. pycnocarpa,** KOERB.

Granitic rocks, Island of Grand Manan, N.B. (*Willey.*)

443. **L. arctica,** SOMMERF.

Upon mosses in alpine and arctic regions.

Greenland. (*Vahl.*) Islands in Behring Strait. (*Wright.*)

444. **L. planetica,** TUCKERM. var. **perfecta,** ECKFELDT.

On limestone shingle at Britannia, near Ottawa, Ont., April 20th, 1895. (*Macoun.*)

445. **L. limosa,** ACH.

On naked earth in alpine and arctic regions.

Greenland and Arctic America. (*Fries.*)

446. **L. alpestris,** SOMMERF.

On earth in alpine and arctic regions.
Greenland and Arctic America. (*Fries.*) Greenland. (*Arct. Man.*)

447. **L. assimilata,** NYL.

On earth in alpine and arctic regions.
Islands of Behring Strait. *Wright.*)

448. **L. melancheima,** TUCKERM.

On dead wood in Canada. (*A. T. Drummond.*)

449. **L. crassipes,** (TH. FR.) NYL.

Upon mosses in alpine and arctic regions.
Arctic America. (*Th. Fries.*)

450. **L. Morio,** SCHÆR. var. **covacina,** SCHÆR.

On alpine and arctic rocks.
Arctic America. (*Dr. Kane.*)

451. **L. aromatica,** (SWARTZ.) ACH.

On rocks, Lake Nipigon, Ont., July 9th, 1884. (*Macoun.*) This species was named by Tuckerman and belongs to the section *Toninia.*

452. **L. crenulata,** (DICKS.) ECKFELDT.

On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

453. **L. crustulata,** ACH.

On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

454. **L. distans,** ECKFELDT.

On rocks, Labrador. (*Waghorne* fide *Eckfeldt.*)

455. **L. empetrea,** NYL.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

456. **L. latypea,** ACH.

On rocks, Chimney Cove, Newfoundland. (*Waghorne.*)

457. **L. Kochiana,** Hepp.

On rocks, Labrador or Newfoundland, (*Waghorne* fide *Eckfeldt.*)

458. **L. dispansa,** Nyl.

On rocks, Labrador or Newfoundland, (*Waghorne* fide *Eckfeldt.*)

459. **L. sylvicola,** (Flot.) Nyl.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

460. **L. conferenda,** (Nyl.) Eckfeldt.

On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

461. **L. contracta,** Th. Fr.

On rocks, Chimney Cove, Newfoundland. (*Waghorne.*)

462. **L. plana,** Lahm.

On rocks, Clark's Brook and Bay of Islands, Newfoundland. (*Waghorne.*)

463. **L. sorediza,** Nyl.

On stones, Lark Harbour, Shoal Point and Ballantyne Cove, Newfoundland. (*Waghorne.*)

464. **L. viridans,** Flot.

On stones, Lark Harbour, Newfoundland. (*Waghorne.*)

465. **L. parasema,** Ach.

On bark of trees, Wild Cove, Newfoundland. (*Waghorne.*)

466. **L. (Biatorina) synothea,** Ach.

On old boards, Birchy Cove, Newfoundland. (*Waghorne.*)

467. **L. fusco-rubens,** Nyl.

Greenland, (*Dr. Brown in Arct. Man.*)

468. **L. Discoensis,** Linds.

Greenland, (*Dr. Brown in Arct. Man.*)

469. **L. Campsteriana,** LINDS.

Greenland. (*Dr. Brown* in *Arct. Man.*)

470. **L. Friesiana,** LINDS.

Greenland. (*Arct. Man.*)

471. **L. Egedeana,** LINDS.

Greenland. (*Dr. Brown* in *Arct. Man.*)

472. **L. subfuscula,** NYL.

Greenland. (*Arct. Man.*)

39. SCOLICIOSPORUM.

473. **S. psotinum,** (FR.) TH. FR.

On stones, Little Harbour, and on bark, St. John's Beach, Newfoundland. (*Waghorne.*)

40. BUELLIA, De Not., Tuck.

474. **B. pulchella,** (SCHRAD.) TUCKERM.

Moist, shaded, alpine, and arctic rocks.
Arctic America. (*Richardson.*)

475. **B. ————,** N. SP.

This species remains unnamed by Mr. Branth, who put it in the first section of the genus—*Catolechia.* On earth along Old Wives' Creek, Assa., May 23rd, 1895. (*Macoun.*)

476. **B. albo-atra,** (HOFFM.) TH. FR.

On trunks, in Canada. (*A. T. Drummond.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Unalaska Island. (*Rothrock.*)

Var. **saxicola,** FR.

On boulders, " elbow " of South Saskatchewan River, Assa., July 13th, 1879. (*Macoun.*)

477. **B. spuria,** (SCHÆR.) ARN.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On limestone rocks in woods at Hull, Que., April 24th, 1897. (*Macoun.*)

478. **B. lepidastra,** TUCKERM.

On limestone rocks west of Hull, Que., April 24th, 1897 ; on boulders near the "elbow" of the South Saskatchewan River, Assa., Aug., 1879. (*Macoun.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

479. **B. parasema,** (ACH.) TH. FR.

Bark of trees and on dead wood ; common.

Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) On dead wood, Chimney Cove, Newfoundland. (*Waghorne.*) On bark, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On bark of various trees and dead wood in many places, Cape Breton Island, N. S., July, 1898 ; on bark of trees at Halifax, N. S. ; at Salt Lake, Anticosti, Que.; on bark and dead wood, Gaspé Co., Que.; on old rails at Port Daniels, Bay of Chaleurs, Que.; abundant on fence-rails and young pines around Ottawa, Ont.; on dead wood and old rails at Belleville, Hastings Co., Ont.; on fence-rails near Wooler, Northumberland Co., Ont.; on trees, Algonquin Park, Ont., June, 1900 ; on birch bark, Lake Nipigon ; on bark of paper birch, Red Deer River, Porcupine Mountains, Man ; on dead wood, Jumping Pound Creek, Rocky Mountains ; on old logs near C. P. R. station at Banff, Rocky Mountains. (*Macoun.*) Port Clarence, Alaska. (*Rothrock.*)

Var. **triphragmia,** NYL.

On *Alnus rubra,* by the sea at Comox, and on Sea's farm near Victoria, Vancouver Island, June 20th, 1893. (*Macoun.*)

480. **B. papillata,** (SOMMERF.) TUCKERM.

Upon dead mosses, etc., in alpine and arctic regions.

Greenland. (*Vahl.*) On moss in woods at Banff ; and on moss along Jumping Pound Creek, Rocky Mountains, June, 1897. (*Macoun.*)

Var. **albo-cincta,** TH. FR.

Islands of Behring Strait. (*Wright.*)

481. **B. myriocarpa,** (DC.) MUDD.

On trees and shrubs ; common on dead wood and stones.

Greenland. (*Vahl.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On old boards, Main Station, Sable Island, N.S., July, 1899 ; on old rails at Margaree, Cape Breton Island, N.S., July, 1898 ; on dead trees along the Gaspé coast, Gaspé Co., Que.; quite common on cedar and pine rails at Ottawa, Ont.; common on cedar rails at Wooler, Ont.; on dead pine at Banff, Rocky Mountains ; on old boards along the wharf at Comox, Vancouver Island. (*Macoun.*) Port Clarence, Alaska. (*Rothrock.*)

482. **B. Schæreri,** DE NOT.

On old rails at Wooler, Northumberland Co., Ont., Oct. 14th, 1893. (*Macoun.*)

483. **B. capitulata,** TH. FR., var. **erubescens,** FLOT.

On smooth rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

484. **B. punctiformis,** (HOFFM.) ECKFELDT.

On dead wood, Chimney Cove, and Little Harbour, Newfoundland. (*Waghorne.*)

485. **B. disciformis,** FR.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Greenland. (*Arct. Man.*)

486. **B. atrata,** (SOMMERF.) ECKFELDT.

On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

487. **B. coracina,** (HOFFM.) TH. FR.

On alpine and arctic rocks.

Arctic America. (*Dr. Kane.*)

488. **B. oidalea,** TUCKERM.

On bark of Douglas fir on Sea's farm near Victoria, and also at Comox, Vancouver Island. (*Macoun.*)

489. **B. Rittokensis,** HELLB.

On rocks, Cape York, Arctic America. (*Th. Fries.*)

490. **B. colludens,** NYL. (TUCKERM.)

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On rocks along the St. Lawrence below Quebec. (*A. T. Drummond.*) Chamisso Island, Arctic Ocean. (*Rothrock.*)

491. **B. excentrica,** (NYL.) ECKFELDT.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

492. **B. badio-atra,** (SCHÆR.) KOERB.

Rocks in alpine and arctic regions.

Greenland. (*Vahl.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On rocks, Deer Park, Columbia River, B.C., June 7th, 1890. (*Macoun.*)

493. **B. petræa,** (FLOT.) TUCKERM.

Common on rocks and dead wood.

Greenland. (*Vahl.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On rocks along the St. Lawrence below Quebec. (*A. T. Drummond.*) On granite boulders in Rockcliffe Park, Ottawa, Ont.; at Belleville and Shannonville, Hastings Co., Ont.; at Lake Nipigon, Ont. (*Macoun.*) St. Paul Island, Kadiak Island and Port Clarence, Alaska. (*Rothrock*)

Var. **Montagnæi,** TUCKERM.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On granite boulders "elbow" of South Saskatchewan River, Assa., July 13th, 1879. (*Macoun.*) St. Paul Island and Unalaska Island, Cook's Inlet and Port Clarence, Alaska. (*Rothrock.*)

Var. **grandis,** FLŒRKE.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On granite boulders in Rockcliffe Park, Ottawa, Ont., April 22nd, 1897. (*Macoun.*)

494. **B. empetraea,** NYL.

On rocks and stones, Labrador or Newfoundland. (*Waghorne.*)

495. **B. coniopsoideum,** (HEPP) ECKFELDT.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

496. **B. Oederi,** (Ach.) Br. & Rostr.

Alpine and arctic rocks. Greenland. (*Vahl.*)

497. **B. geographica,** Linn.) Tuckerm.

On rocks in alpine and arctic regions.

Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Newfoundland. (*Pylaie.*) On rocks, Tadousac, Que. (*A. T. Drummond.*) On sandstone ridges, Wood Mountain, Assa., June, 1895 ; on rocks in the Crow's Nest Pass, Aug. 20, 1897 ; quite common on all the higher Rocky Mountains. (*Macoun.*) Aliaska Peninsula, Alaska. (*Rothrock.*)

Var. **lecanorina,** Flœrke.

On rocks, Island of Grand Manan, New Brunswick. (*Willey.*)

498. **B. alpicola,** (Wahl.) Anz.

On alpine and arctic rocks. Arctic America. (*Th. Fries.*)

499. **B scabrosa.** (Ach.) Koerb.

On *Bœomyces* in alpine and arctic regions.

Greenland. (*Vahl.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

500. **B. Parmeliarum,** (Sommerf.) Tuckerm.

Upon the thallus of species of *Parmelia* and *Cetraria.*

On *Cetraria Fahlunensis*, Islands of Behring Strait. (*Wright.*) On *Parmelia olivacea*, Leading Tickle, Newfoundland. (*Waghorne.*)

501. **B. saxatilis,** (Schær.) Koerb.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

502. B. **urceolata,** Th. Fr.

Upon the thallus of various lichens. Greenland. (*Vahl.*)

503. **B. parasitula,** Nyl.

Found on *Pilophorus cereolus*, var. *robustus*, on the islands in Behring Strait. (*Wright.*)

504. **B. glaucomaria,** (Nyl.) Tuckerm.

On the thallus of *Lecanora glaucoma*, Greenland. (*Stitzenberger.*

505. **B. Pertusaricola,** WILLEY.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On the thallus of a *Pertusaria*, on poplar trees at Ottawa, Ont., Oct. 16th, 1889. (*Macoun.*)

506. **B. obscurata,** (ACH.) ECKFELDT.

On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Quite common on limestone and other rocks around Ottawa, Ont., and at Aylmer, Que., 1900. (*Macoun.*)

507. **B. rivularis,** (FLOT.) ECKFELDT.

On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

508. **B. Copelandi,** (KOERB.) ECKFELDT.

On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

509. **B. concreta,** (KOERB.) ECKFELDT.

On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*

510. **B. calcarea,** (WEIS.) ECKFELDT.

On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

511. **B. rubescens,** (ARN.) ECKFELDT.

On smooth bark, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

512. **B. verruculosa,** BON.

On stones, Chimney Cove, Newfoundland. (*Waghorne.*)

513. **B. reductum,** TH. FR.

On stones, Birchy Cove and Summerside, Newfoundland. (*Waghorne.*)

514. **B. (Rhizocarpon) empetræum,** NYL.

On rocks, Labrador, 1896 ; on rocks, Lark Harbour, Newfoundland. (*Waghorne.*)

41. LECANACTIS, (Eschw.) Koerb.

515. **L. abietina,** (Ach.) Koerb.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On trunks of spruce, Arctic America, between Lat. 54° and 64° N. (*Richardson.*)

516. **L. premnea,** Ach. var. **chloroconia,** Tuckerm.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On white spruce bark, Swan Lake House, Lake Winnipegosis, Man., July 6th, 1881. (*Macoun.*)

42. OPEGRAPHA, Humboldt.

517. **O. varia,** (Pers.) Fr.

On birch bark, Frenchman's Cove, Newfoundland. (*Waghorne.*) On bark of butternut trees at Ottawa, Ont.; on bark of white cedar and spruce trees, Lake Nipigon, Ont. (*Macoun.*)

518. **O. vulgata,** Ach.

On bark of conifers, Half Way Point, Newfoundland. (*Waghorne.*) On bark of *Alnus rubra,* by the sea, at Comox, Vancouver Island, June 20th 1893; on ash bark near the Rideau River, at the Hogsback, near Ottawa, Ont., and at Leamy's Lake, near Hull, Que., May 7th, 1897. (*Macoun.*)

519. **O. zonata,** Koerb.

On rocks, Lark Harbour, Newfoundland. (*Waghorne.*)

520. **O. atra,** Ach.

Labrador or Newfoundland. (*Waghorne fide Eckfeldt.*)

521. **O. saxicola,** Ach.

On sandstone rocks, Goose Arm, Newfoundland. (*Waghorne.*)

43. XYLOGRAPHA, Fries.

522. **X. parallela,** (Ach.) Fr.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On old fence rails at Margaree, Cape Breton Island, N.S., July, 1898; on

old fences, Main Station, Sable Island, N.S., July, 1899; on dead wood in northern British Columbia. (*Macoun.*) Islands in Cross Sound, Alaska. (*Rothrock.*)

523. **X. Opegraphella,** NYL.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

On dead wood on the island of Grand Manan, New Brunswick. (*Willey.*) On old logs on the sea beach, Gaspé coast, Gaspé Co., Que.; on old rails at Margaree, Cape Breton Island, N.S., July, 1898. (*Macoun.*) Cook's Inlet, Alaska. (*Rothrock.*)

44. GRAPHIS, Ach.

524. **G. scripta,** ACH., var. **limitata,** SCHÆR.

Quite common on bark of various trees.

On bark at Frenchman's Cove; also under various forms in other localities, Newfoundland. (*Waghorne.*) On bark, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) On alder bark at Baddeck, Cape Breton Island, N.S., 1898; on trees, Gaspé Co., Que.; very common on bark of hickory, maple, birch, basswood and ironwood at Ottawa, Ont.; on beech trunks, common, at Belleville, Hastings Co., Ont.; on beech trees, Seymour West, Northumberland Co., Ont.; on spruce bark, North Bay, Lake Nipissing, Ont.; on young alders, Algonquin Park, Ont., 1900; on bark along Lake Winnipegosis, Man.; on birch bark at Hastings, Burrard Inlet, B.C.; on poplar and Douglas fir near Victoria, and on bark at Comox, Vancouver Island. (*Macoun.*)

Var. **recta,** SCHÆR.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On bark of canoe birch at Salt Lake, Anticosti, Que.; along the Ste. Anne des Monts River, Gaspé Co., Que.; on bark of canoe birch at Baddeck and Margaree, Cape Breton Island, N.S., 1898; in woods at Hull, Que.; on birch trees Algonquin Park, Ont, June, 1900. (*Macoun.*)

Var. **serpentina,** ACH.

On pine bark at Belleville, Hastings Co., Ont.; and on bark of *Juglans cinerea* west of Hull, Que., April 24th, 1897; on *Rhamnus Purshiana* at Comox, Vancouver Island. (*Macoun.*)

45. ARTHONIA, Ach.

525. **A. patellulata,** Nyl.

On trees, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On aspen poplar trees, Moose Mountain, Man., July 3rd, 1880. (*Macoun.*)

526. **A. astroidea,** Ach.

On bark of trees, common.

Bay of Exploits, Newfoundland. (*Waghorne.*) Abundant on trees around Ottawa, Ont., and at Hull and Aylmer, Que.; quite common at Belleville, Hastings Co., Ont.; on balsam fir at King's Mountain, Chelsea, Que., 1897. (*Macoun.*)

527. **A. Swartziana,** Ach.

Frequent on bark of trees along St. Mary's River, Anticosti, Que.; on trees at Cove Head, Prince Edward Island, 1888; at Shannonville, Hastings Co., Ont.; on balsam fir, Lake Winnipegosis, Man.; on ash and maple trees at Leamy's Lake, Hull, Que., 1897. (*Macoun.*)

528. **A. medilla,** Nyl.

On dead wood, Greenland. (*Vahl.*)

529. **A. spectabilis,** Flot.

Quite common on old thick bark of various trees.

Bay of Exploits, Newfoundland. (*Waghorne.*) On maple trees at Ottawa, Ont.; on bitter-nut hickory at Hull and on basswood at Aylmer, Que.; on basswood at Carleton Place, Ont.; on ash trees, Central Ontario Junction and basswood and other trees at Belleville, Hastings Co., Ont.; on maple trees, Port Colborne and Canfield Junction, southwestern Ontario. (*Macoun.*)

530. **A. radiata,** (Pers.) Th. Fr.

On bark at Hastings, Burrard Inlet, B. C., 1887; on *Alnus rubra* at Comox, Vancouver Island, June 23rd, 1893. (*Macoun.*)

531 **A. lecideella,** Nyl.

Chiefly on the bark of young *Pinus Strobus* at Ottawa, Ont.; on *Acer spicatum* at Aylmer, Que.; on pine, ash and basswood at

Belleville, Hastings Co., Ont.; on young pines and poplars at Wooler, Ont. (*Macoun.*)

532. **A. dispersa,** (SCHRAD.) NYL.

On bark, Irishtown, Newfoundland. (*Waghorne.*) On bark of young maples at Ottawa, Ont., April 16th, 1892, and on maple bark near Leamy's Lake, Hull, Que., 1897. (*Macoun.*)

533. **A. tædiosa,** NYL.

On young beech and maples at Buckingham, Que., May 14th, 1896. (*Macoun.*)

534. **A. populina,** MASS.

On poplar bark at Grand Lake and Lark Harbour, Newfoundland. (*Waghorne.*)

535. **A. raunidia,** NYL.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

46. MYCOPORUM, Nyl.

536. **M. pycnocarpum,** NYL.

On bark of oak trees at Aylmer, Que.; abundant on young trees of *Acer rubrum* in a swamp above the Central Ontario Junction, Hastings Co., Ont. (*Macoun.*)

47. SIPHULA, Fries.

537. **S. ceratites,** NYL.

Clearwater Lake, northern Labrador, July 21st, 1896. (*A. P. Low.*) This occurs on islands in Behring Strait. (*Wright.*) On Attu Island, Behring Sea, Aug. 29th, 1901. (*J. M. Macoun.*)

48. SPHÆROPHORUS, Pers.

538. **S. globiferous,** (LINN.) DC.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Arctic America. (*Herb. Hooker.*) On earth in bogs, Salt Lake, Anticosti, Que.; on trees in bogs and on rocks at Truro, N.S.; on rocks, summit of Mount Albert, Gaspé Co., Que.; on trees at Hastings, Burrard Inlet, B.C.; on trees at Nanaimo, Vancouver

Island. (*Macoun.*) On rotten logs, Johnson's Strait and Thurlow Island, Gulf of Georgia, B.C. (*Dr. G. M. Dawson.*) St. Paul and St. George islands, Behring Sea ; Port Etches, Alaska, and Carmanah Point, Vancouver Island. (*J. M. Macoun.*) Loring ; also at Salmon Creek, Juneau, Alaska. (*Miss G. Cooley.*) St. Matthew Island, Port Mulgrave, and on the Shumagin Group, Alaska. (*Rothrock.*)

539. **S. compressum,** ACH.

Rocks and on earth in alpine districts.

Arctic America. (*Richardson.*) On rocks, Cape Chudleigh, Digge's Island and Cape Prince of Wales, Hudson Strait. (*Dr. R. Bell.*) On trees Burnside Road, Victoria, Vancouver Island. (*Macoun.*)

540. **S. fragile,** (LINN.) PERS.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Northward to Arctic America. (*Hooker.*) On rocks St. Paul Island, Behring Sea, June 28th, 1897. (*J. M. Macoun.*) On earth at the forks of Old Wives' Creek, Assa., June 1st, 1895. (*Macoun.*)

49. ACOLIUM, De Not.

541. **A. tigillare,** DE NOT.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Arctic America. (*Richardson.*)

542. **A. tympanellum,** (ACH.) DE NOT.

On the old wharf at Hastings, Burrard Inlet, B.C., April 16th, 1889 ; and on old wharf at Comox, Vancouver Island, June, 1893. (*Macoun.*)

50. CALICIUM, De Not.

543. **C. phæocephalum,** (TURN.) TURN. & BARR.

On bark of trees, Canada. (*A. T. Drummond.*) On bark of dead spruce, Hector, Rocky Mountains ; on bark of Douglas Fir, Comox, Vancouver Island. (*Macoun.*)

544. **C. lenticulare,** (HOFFM.) ACH.

On decaying wood in Canada. (*A. T. Drummond.*)

545. **C. subtile,** Fr.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On dead wood, Arctic America. (*Richardson.*) On rotten wood, Bass River, Kent Co., N.B. (*Prof. Fowler.*) On dead wood at Ottawa, Ont. (*Macoun.*) On bark at Laggan, Rocky Mountains. (*Bean.*)

546. **C. fuscipes,** Tuckerm.

On dead wood, London, Ont. (*A. T. Drummond.*)

547. **C. trichiale,** Ach.

On dead spruce logs, Gaspé coast, Que.; on dead cedar logs, Nipigon River, Ont. (*Macoun.*)

548. **C. roscidum,** Flœrke.

On dead wood, Arctic America. (*Richardson.*)

549. **C. turbinatum,** Pers.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Parasitical on *Pertusaria;* Canada. (*A. T. Drummond.*) On the slopes of Mount Albert, Gaspé Co., Que. *Macoun.*)

550. **C. hyprellum,** Ach.

On the inner bark of conifers, Halfway Point, Newfoundland. (*Waghorne.*) On bark of Douglas fir, on Sea's farm, near Victoria, Vancouver Island, May 6th, 1893. (*Macoun.*)

551. **C. trabinellum,** Schl.

On dead wood, Halfway Point, Newfoundland. (*Waghorne.*)

552. **C. salicinum,** Pers.

On dead wood, Siles Point, Halfway Point, Birchy Cove and on bark at Deer Lake, Newfoundland. (*Waghorne.*)

553. **C. minutum,** Koerb.

On old boards at Goose Arm, and on boards and dead wood at Ballantyne Cove, Newfoundland. *Waghorne.*)

554. **C. pusillum.** FLŒRKE.

On dead wood, St. John's Beach, Newfoundland. (*Waghorne.*) On old rails near Aylmer, Que., May 22nd, 1897. (*Macoun.*)

555. **C. parietinum,** ACH.

On mossy wood Sandy Point, Bay of St. George and Siles Point, Newfoundland. (*Waghorne.*)

51. CONIOCYBE, Ach.

556. **C. furfuracea,** (LINN.) ACH.

On stems of plants, Birchy Cove, and Middle Arm, and on stones, Ballantyne Cove, Newfoundland. (*Waghorne.*) On the roots of trees, chiefly pine, in the shade at Dow's swamp, near Ottawa, Ont, and on pine roots at Ironsides, Que.; on old stumps in Algonquin Park, Ont., June, 1900. (*Macoun.*)

52. ENDOCARPON, Hedw.

557. **E. miniatum,** (LINN.) SCHÆR.

On limestone and other rocks.

Shoal Point and Halfway Point, Newfoundland. (*Waghorne.*) Greenland. (*Arct. Man.*) Arctic America. (*Richardson.*) On rocks, Hastings Co., Ont.; on rocks, Bow River Pass, Rocky Mountains ; on rocks at Yale, B.C.; on rocks, by the sea, Victoria Arm, Victoria, Vancouver Island. (*Macoun.*)

Var. **complicatum,** SCHÆR.

On rocks mostly near water.

Greenland. (*Vahl.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On rocks along the Ste. Anne des Monts River, Gaspè Co., Que.; on rocks, Lake Nipigon, at Thunder Bay, Lake Superior, and at Savanne, west of Lake Superior ; at Deer Park, Lower Arrow Lake, Columbia River, B.C. (*Macoun.*) On rocks, Pearse Island, Gulf of Georgia, 1885. (*Dr. G. M. Dawson.*)

Var. **fulvofuscum,** TUCKERM.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

558. **E. fluviatile,** DC.

On rocks in streams, generally covered by water.

On stones in a brook, Canaan Forks, Queen's Co., N.B. (*J. Moser.*) On rocks in a brook at Margaree and Halfway Brook, Cape Breton Island, N.S., 1898; on rocks in a mountain brook, Meech's Lake, near Chelsea, Que.; at Hull, Que, and on the cliffs, Rockcliffe, Ottawa, Ont.; on rocks, Old Man River, Crow's Nest Lake, Rocky Mountains, Alta., 1897; on stones in water. Câche Lake, Algonquin Park, Ont., June, 1900. (*Macoun.*)

559. **E. hepaticum,** Ach.

On earth in Greenland. (*Vahl.*) On earth, Hastings Co., Ont.; on earth, "elbow" of South Saskatchewan, Assa., July 13th, 1879. (*Macoun.*)

560. **E. rufescens,** Ach.

On earth, Greenland. (*Vahl.*)

561. **E. cinereum,** Pers.

On earth, Bay of Exploits, Newfoundland. (*Waghorne* fide *Eckfeldt.*) St. Paul's Island, Behring Sea, Alaska. (*Rothrock.*)

53. STAUROTHELE, Norm.

562. **S. Drummondii,** Tuckerm.

On Trenton limestone, at Kingston, Ont. (*A. T. Drummond.*)

563. **S. umbrina,** (Wahl.) Tuckerm.

Greenland. (*Arct. Man.*) On limestone rocks, Kingston, Ont. (*A. T. Drummond.*)

54 SEGESTRIA, Fries.

564. **S. majusculum,** Nyl.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

55. TRYPETHELIUM, Spreng.

565. **T. virens,** Tuckerm.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On trees in Canada. (*A. T. Drummond.*) At Big Intervale, Margaree,

Cape Breton Island, N. S., 1898; on beech trees at Beechwood and Casselman, near Ottawa, Ont.; near Wooler and at Belleville, Ont. (*Macoun.*) On bark, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*)

56. SAGEDIA, Mass.

566. **S. Cestrensis,** TUCKERM.

On bark of maples, Margaree, Cape Breton Island, N.S., July, 1898; on young maples at Ottawa, Ont., May, 1892; on King's Mountain, Chelsea, Que., May, 1897. (*Macoun.*)

567. **S. oxyspora,** (NYL.) TUCKERM.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

568. **S. carpinea,** PERS.

On bark, St. John's Beach, Newfoundland. (*Waghorne.*)

57. VERRUCARIA, Pers.

569. **V. epigæa,** (PERS.) ACH.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On earth along the Gaspé coast, Que., Aug. 11th, 1882. (*Macoun.*)

570. **V. maura,** (WAHL.) NYL.

On granitic rocks by the sea shore.

Greenland. (*Vahl.*) On rocks, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) Fort Alexander, Cook's Inlet, Alaska. (*Rothrock.*)

571. **V. centhocarpa,** WAHL.

On granite rocks often wet by the sea.

Greenland. (*Vahl.*) Fort Alexander with the above species. (*Rothrock.*)

572. **V. nigrescens,** PERS.

On limestone rocks, Canada. (*A. T. Drummond.*)

573. **V. intercedens,** NYL.

Cape Lisburne, Alaska. (*Rothrock.*)

574. **V. intermedia,** (TH. FR.) WILLEY.

Cape Lisburne, Alaska. (*Rothrock.*)

575. **V. rupestris,** SCHRAD.

On rocks St. John's Beach, Newfoundland. (*Waghorne.*) On limestone rocks, Kingston, Ont. (*A. T. Drummond.*) On limestone cliffs, Rockcliffe, Ottawa, Ont., Nov. 11th, 1896. (*Macoun.*)

576. **V. nigricola,** ARNOLD.

On bark, Middle Arm, Newfoundland. (*Waghorne.*)

577. **V. theliodes,** SOMMERF.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

578. **V. Nylanderi,** HEPP.

On limestone rocks, Kingston, Ont. (*A. T. Drummond.*)

579. **V. microloba,** TUCKERM.

On limestone rocks, Kingston, Ont. (*A. T. Drummond.*)

580. **V. terrestris,** TH. FR.

Behring Strait. (*Wright.*)

581. **V. Nepigona,** TUCKERM.

On the surface of peat on rocks, Lake Nipigon, July 10th, 1884. (*Macoun.*)

582. **V. bryophila,** LORMR.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

583. **V. rimosicola,** LEIGHT.

Parasitic on *Buellia excentricum,* Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

584. **V. amylacea,** HEPP.

On limestone rocks, Goose Arm, Newfoundland. (*Waghorne.*

585. **V. chlorotica,** ACH.

On stones, Goose Arm, and Lark Harbour, Newfoundland. (*Waghorne.*)

586. **V. pachyderma,** ARNOLD.

On rocks, Lark Harbour, Newfoundland. (*Waghorne.*)

587. **V. aquatilis,** MUDD.

On stones, Goose Arm, Newfoundland. (*Waghorne.*)

588. **V. papillosa,** FLOERKE.

On stones, Clark's Brook, Davis Cove, St. John's Beach, Middle Arm, Halfway Point, Coal River and River Head; also another form at Chimney Cove, and another at Wild Cove, Newfoundland. (*Waghorne.*)

589. **V. brachyspora,** ARNOLD.

On stones, Middle Arm, Newfoundland. (*Waghorne.*)

590. **V. dolosa,** HEPP.

On stones, Leading Tickle and Frenchman's Cove, Newfoundland. (*Waghorne.*)

591. **V. epidermidis** forma **punctiformis,** BRANTH.

Greenland. (*Arct Man.*) On living alder stems along the Rideau Rive , south of Ottawa, Ont., April 30th, 1897. (*Macoun.*)

58. PYRENULA, (Ach.)

592. **P. punctiformis,** (ACH.) NÆG. & HEPP.

On basswood bark, Central Ontario Junction, Hastings Co., Ont.; on bark, Canfield Junction, Ont.; on maple bark, King's Mountain, Chelsea, Que., and Rockcliffe Park, Ottawa, Ont., 1897. (*Macoun.*) Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

593. **P. thelæna,** (ACH.) TUCKERM.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*) On bark of a young white birch along the Rideau River, near the

Hogsback, south of Ottawa, Ont., April 30th, 1897; along the Beaver Meadow, Hull, Que. (*Macoun.*)

594. **P. gemmata,** (Ach.) Næg. & Hepp.

On bark of trees along the Gaspé Coast, Que.; on maple trunks at Ottawa, Ont.; on trunks at Belleville and Central Ontario Junction, Hastings Co., Ont. (*Macoun.*) On bark, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*)

595. **P. cinerella,** (Flot.) Tuckerm.

On maple and black ash bark at Ottawa, Ont., April 19th, 1898. (*Macoun.*)

596. **P. hyalospora,** (Nyl.) Tuckerm.

On bark of trees, London, Canada. (*A. T. Drummond.*) On bark of trees at Belleville, Hastings Co., Ont. (*Macoun.*)

597. **P. patellaræformis,** Eckfeldt.

On young black ash, Billing's bush, Rideau Park, Ottawa, Ont., April 19th, 1897. (*Macoun.*)

598. **P. leucoplaca,** (Wallr.) Kœrb.

On bark of black ash at Belleville and of maples at Central Ontario Junction, Hastings Co., Ont.; on maple bark in woods near Hull, Que., May 5th, 1897. (*Macoun.*)

599. **P. pithyophila,** Th. Fr.

On blue beech bark, Central Ontario Junction, Hastings Co., Ont., Oct. 24th, 1893. (*Macoun.*)

600. **P. mamillana,** (Ach.) Tuckerm.

On bark of trees at Carleton Place, near Ottawa, Ont.; also on trees at Shannonville, Hastings Co., Ont. (*Macoun.*)

601. **P. fallacia,** Eckfeldt.

On young maple trees at Chelsea, Que., May 15th, 1894. (*Macoun.*)

602. **P. nitida,** Ach.

On bark, Rigaud Mountain, Vaudreuil Co., Que. (*Rev. G. Ducharme.*) Quite common on trunks, of beech trees at Ottawa

and vicinity ; at Belleville and Seymour West, Ont.; on birch trees at Hastings, Burrard Inlet, B.C. (*Macoun.*)

603. **P. glabrata,** ACH.

On trees, Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

604. **P. lactea,** MASS.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

605. **P. nitidella,** MULL.

Labrador or Newfoundland. (*Waghorne* fide *Eckfeldt.*)

59. PYCNIDES.

606. **P. verisimilide,** BRANTH.

On black ash bark at Billing's bush, Rideau Park, south of Ottawa, Ont., April 19th, 1897. (*Macoun.*)

ADDENDUM.

PHYSCIA.

607. **P. scopularis,** NYL.

On rocks, Capstan Island, Labrador ; and on stones, Bay of Islands, Newfoundland. (*Waghorne.*)

NORMANDIA.

608. **N. lætevirens,** TURN. & BORR.

On rocks, St. George Island, Behring Sea, Alaska, June 17th, 1897. (*J. M. Macoun.*) Greenland. (*Arct. Man.*)

RINODINA.

609. **R. pyrina,** ACH.

On stones, Coal River, and on rocks at Meadows, Little Harbour and River Head, Newfoundland. (*Waghorne.*)

BIATORA.

610. **B. asserculorum,** SCHRAD.

On old wood at L'Anse au Clair, Labrador. (*Waghorne.*)

LECIDEA.

611. **L. intumescens,** FLOERKE.

Parasitic on the thallus of *Lecanora sordida;* on stones at Chimney Cove, Newfoundland. (*Waghorne.*)

SECOLIGA.

612. **S. Friesii,** FLOT.

On decaying vegetable matter, St. John Beach, Newfoundland. (*Waghorne.*)

CONIANGIUM.

613. **C. lapidicolum,** TAYL.

On stones, Chimney Cove, Newfoundland. (*Waghorne.*)

614. **C. exile,** FLOERKE,

On bark, Clark's Brook, Newfoundland. (*Waghorne.*)

ADDENDUM TO PART VI.

1. **SPHAGNUM**, Dill.

2. **S. Girgensohnii,** Russ.

Sukkertoppen, Greenland, Aug. 6th, 1886. (*Jensen.*) Swamps at Edmonton, Murray mine, Sudbury, and Sunbridge, Ont. (*Jas. White.*) Abundant in Algonquin Park, Ont., 1890. (*Macoun.*) Queen Charlotte Islands, B.C. (*Law.*) Chilliwack River, B.C., July, 1901. (*J. M. Macoun.*) Swamps, head of Lake Lindeman, Yukon, 1898. (*Williams.*)

Var. **gracilescens,** Warnst, forma **squarrosa,** Warnst.

Peat bog, Câche Lake, Algonquin Park, Ont., June 6th, 1900. (*Macoun.*)

Var. **stachyodes,** Warnst.

Peat bog, Catfish Lake, Algonquin Park, Ont., July 23rd, 1900. (*Macoun.*) Port Etches, Alaska, June, 1892. (*J. M. Macoun.*)

Var. **hygrophilum,** Warnst.

Wet woods, Casselman, Ont. (*Macoun.*) Swamps, Edmonton and Sudbury, Ont., 1893. (*Jas. White.*)

3. **S. Russowii,** Warnst. var. **pœcilum**, Warnst.

Peat bog, Câche Lake, Algonquin Park, Ont., June, 1900. (*Macoun.*)

Var. **rhodochroum,** Russ.

Battle Harbour, Labrador, 1893. (*Waghorne.*)

Var. **Girgensohnioides,** Russ.

In a peat bog, Chalk River, Ont., Oct., 1892. (*Mac un.*)

4. **S. fuscum,** Schpr. var. **fuscescens,** Warnst.

In a peat bog, Catfish Lake, Algonquin Park, Ont., July, 1900; peat bog, Prince Albert, Sask., June, 1896. (*Macoun.*) In swamps about Dawson, Yukon, 1899. (*Williams.*)

Var. **pallescens**, WARNST.

Bogs, Jumping Pound Creek, Alta., 1897. (*Macoun.*) In a bog, Lat. 61°, Long. 104°, W. July 24th, 1893. (*J. W. Tyrrell.*)

Var. **viride,** WARNST.

In peat bogs, Chalk River and Algonquin Park, Ont., July, 1900. (*Macoun.*)

5. **S. tenellum,** SCHPR. var. **rubrum,** WARNST.

In bogs, Greenland. (*Ryder.*) In bogs, Belledune, New Brunswick, 1875. (*Chalmers.*) In bogs, Port Arthur, Ont., 1889. (*Thos. Walker.*) Fort Good Hope, Mackenzie River, July 18th, 1892. (*Miss E. Taylor.*) Bogs, Lat. 61°, Long. 104°, W., July 24th, 1893. (*J. W. Tyrrell.*)

6. **S. Warnstorfii,** RUSS.

In a peat bog, Algonquin Park, Ont., July, 1900. (*Macoun.*) Port Etches, Alaska, Aug., 1892. (*J. M. Macoun.*) Swamps at the head of Lake Lindeman Yukon, 1898. (*Williams.*)

Var. **versicolor,** C. JENSEN.

In bogs, Greenland. (*Rosenvinge.*)

Var. **purpurascens,** RUSS.

North Arm, Newfoundland, 1899. (*Waghorne.*) In a swamp at the head of Lake Lindeman, Yukon, 1898. (*Williams.*)

Var. **viride,** WARNST.

In a cedar swamp at Southampton, Bruce Co., Ont., August, 1901. (*Macoun.*)

10. **S. Lindbergii,** SCHPR. var. **microphyllum,** WARNST.

St. Paul Island, Behring Sea. (*J. M. Macoun.*)

11. **S. riparium**, AONGSTR.

L'Asne au Loup, Labrador, 1894. (*Waghorne.*)

13. **S. cuspidatum,** EHRH.

Abundant in a peat bog, Brulé Lake, Algonquin Park, June, 1900. (*Macoun.*)

Var. **submersum,** SCHPR.

Newfoundland, 1893. (*Waghorne.*) Mer Bleue, near Ottawa, Ont., June, 1892. (*Macoun.*)

16. **S. teres,** AONGSTR. var. **squarrosulum,** (LESQ.) SCHPR.

Cañon City, Dyea Creek, on a damp mountain side, Alaska, 1899. (*Williams.*)

17. **S. Wulfianum,** GIRG.

Canaan Forks, N.B., Aug., 1894. (*J. Moser.*) Quite common in the Mer Bleue, near Ottawa, Ont., and in Algonquin Park, Ont. (*Macoun.*)

18. **S. compactum,** DC.

Peat bogs, Labrador, Aug., 1897. (*A. P. Low.*) Bogs, Departure Bay, Nanaimo, Vancouver Island, June, 1887. (*Macoun.*)

20. **S. Pylaiei,** BRID.

Abundant in a bog near Aspey Bay, Cape Breton Island, N.S., Aug. 6th, 1898. (*Macoun.*)

23. **S. imbricatum,** HORNSCH.) RUSS.

Very abundant in bogs near Aspey Bay, and around Louisburg, Cape Breton Island, N.S.; Aug., 1898; in damp woods, near the roundhouse, Niagara Falls, Ont., May 14th, 1901. (*Macoun.*)

954. **S. obtusum,** WARNST.

This species seems to be very rare. Only a few stems were collected floating on the marshy border of a lake near Lake Opeongo, Algonquin Park, Ont., Aug. 20th, 1900. (*Macoun.*) Named by Dr. Warnstorf.

955. **S. molle,** SULLIV.

This is a common species around boggy depressions and ponds on Sable Island, N.S., July 1899. (*Macoun.*)

956. **S. centrale,** ARN. & JENS.

Notre Dame Bay, Newfoundland, 1893. (*Waghorne.*)

957. **S. Duseni,** WARNST.

White Cove, Seal Bay, Newfoundland, 1891. (*Waghorne.*)

2. ANDREÆA, Ehrhart.

28. **A. petrophila,** EHRH.

A common species on rocks, both dry and wet, at Baddeck, Margaree, Louisburg, and Half-way Brook, Cape Breton Island, N.S., July, 1898; on rocks, Câche Lake, Algonquin Park, Ont., June, 1900. (*Macoun.*) Summit Lake, Manicuagan River, Eastern Quebec, July, 1895. (*A. P. Low.*) Common about Lake Lindeman, Yukon, May 17th, 1899, in fine fruit. (*Williams.*)

Var. **papillosa,** LINDB.

On rocks, Greenland. (*Lange.*)

Var. **acuminata,** SCHIMP.

Lake Lindeman, Yukon, 1899; all the specimens examined seemed to be dioiceous. (*Williams.*)

Var. **parvifolia,** (MULL.) WILLIAMS.

Sheep Camp, Dyea Creek, Alaska, 1899. (*Williams.*)

Subsp. **sublævis,** KINDB. Europ. & Am. Mosses, Pt. II., 393.

Leaves small, distant, spreading, generally nearly smooth; perichetial leaves generally acute, long-acuminate. Tufts low, blackish brown.

On rocks, Carmanah Point, south coast of Vancouver Island, May 9th, 1892. (*J. M. Macoun.*)

33. **A. crassinervis,** BRUCH.

On rocks, northern Newfoundland. (*Waghorne.*)

958. **A. Rothii,** WEB. & MOHR., Subsp. **falcata,** SCHIMP.

On rocks, Parson's Mountain, near Victoria, Vancouver Island, May 19th, 1893. (*Macoun.*)

959. **A. obtusifolia,** BERGGREN.

On rocks, Greenland. (*Berggren.*)

5. PHASCUM, Linn.

38. **P. cuspidatum,** SCHREB.

On earth on the wood roads around the base of Queenston Heights, Ont. ; in fine fruit, May 8th, 1901. Found only on hard baked earth. (*Macoun.*)

8. GYMNOSTOMUM, Hedw.

43. **G. calcarea,** NEES & HORNSCH.

On rocks, Credit Forks, Ont. (*James White. Thos. Walker.*) On earth in a ravine at Grand Narrows, Cape Breton Island, N.S., 1898. (*Macoun.*)

44. **G. rupestris,** SCHLEICH.

On ledges and boulders at the old mill, Rockliffe, Ottawa, Ont., 1896. (*Macoun.*)

45. **G. curvirostris,** EHRH.

On dripping rocks, Credit Forks, Ont. (*Jas. White Thos. Walker.*) On wet ledges of rocks, Rockcliffe, Ottawa, and at King's Mountain, Chelsea, Que., 1897 ; on rocks at Saddle Mountain, Banff, Alta.; in the Crow's Nest Pass, and on Moose Mountain, Alta., Rocky Mountains, 1897. (*Macoun.*) Yukon River cliffs, just below Dawson, Yukon, 1899. (*Williams.*)

Var. **commutatum,** CARD. & THER. (Bot. Gaz. Vol. p.)

This variety has long narrow leaves and the cells of the areolation are everywhere long and smooth. In the type, the upper areolation is composed of irregular cells, rectangular, quadrate and triangular, with scattered papillæ.

Newfoundland. (*Waghorne.*)

47. **G. tenue,** SCHRAD.

On damp limestone rocks at Credit Forks, Ont., 1893. (*James White.*) Drummond's specimen No. 21 from Lake Winnipeg belongs here, but the reference from Owen Sound in Pt. VI. belongs to the next.

960. **G. pusilla,** KINDB., Revue Bryol. 1896.

Leaves obtusate, subacute, not arrounded at the apex. Perichetial not larger and not sheathing, the inner one subovate and shorter. Capsule oblong, not longer than the beak ; teeth none or rudimentary. Annulus not revoluble. Resembles *Weisia tenuis* in size.

On limestone rocks at Owen Sound, Ont., July 31st, 1871 ; on earth in a ravine at Grand Narrows, Cape Breton Island, N.S., 1898. *(Macoun.)*

9. EUCLADIUM, Bryol. Europ.

48. **E. verticillatum,** BRYOL. Europ.

On wet rocks on Carmanah Point, south coast of Vancouver Island, May, 9th, 1892. *(J. M. Macoun.)*

10. ANŒCTANGIUM, Schw.

49. **A. compactum,** SCHW.

On rocks on Nagai Island, Shumigan Group, Alaska, Sept. 18th, 1891. *(J. M. Macoun.)*

961. **A. Canadense,** KINDB., Ott. Nat. vol. XIV, 86.

Leaves small, channeled, involute, smooth and (also at the base) entire, from broad base abruptly acuminate ; only the lowest basal cells narrow ; costa scarcely excurrent ; tufts dense, rusty red with green branching tops, about 5 cm. high ; capsules not seen.

The specimens upon which this was founded were collected near Victoria, Vancouver Island, May 7th, 1875. *(Macoun.)*

11. WEISIA, Hedw.

50. **W. viridula,** LINN.

The Hull and Victoria references in Part VI. p. 14, are to be taken out.

51. **W. convoluta,** C. M. & KINDB.

On a bank near the sea above Comox, Vancouver Island, June 20th, 1893. *(Macoun.)*

962. **W. rutilans,** HEDW.

W. Wolfii, Lesq. & James, Mosses of N. America, 57.

On earth at Leamy's Lake, Hull, Que., Sept. 16th, 1889; on earth at Victoria, Vancouver Island, Dec. 23rd, 1875, named *W. Wolfii* by Austin. (*Macoun.*)

Var. **Ganderi,** JURATZKA.

Capsule oblong, scarcely longer than the beak.

On earth, subject to flood, along the Bonnechere at Golden Lake, Sept. 27th, 1900; also on earth on old stumps subject to flood, shore of Lake Duchesne above Britannia, near Ottawa Ont., Oct., 1900. (*Macoun.*)

12. DICRANOWEISIA, Lindb.

52. **D. crispula,** (HEDW.) LINDB.

On rocks at the mouth of Skeena River, B.C.; also on Attu Island, Behring Sea, 1891. (*J. M. Macoun.*) On rocks, Moose Mountain, Rocky Mountains, Alta., alt. 6,500 feet, July, 1897. (*Macoun.*) Above the basin at Juneau, Alaska. (*Miss G. Cooley.*) Common on rocks around Lake Lindeman, Yukon, 1899. (*Williams.*)

53. **D. cirrhata,** LINDB.

Fort Chimo, Labrador, Aug. 30th, 1896. (*A. P. Low.*)

963. **D. obliqua,** KINDB.

On stones along Asulcan Creek, near the glacier, Selkirk Mountains, B.C., Aug. 7th, 1890. (*Macoun.*)

964. **D. contermina,** REN. & CARD.

Common on rocks around Lake Lindeman, Yukon, 1899. (*Williams.*)

14. RHABDOWEISIA, Bruch & Schimp.

55. **R. striata,** SCHRAD.

R. fugax, Bruch & Schimp, Cat. Can. Musci., Pt. VI., 16.

On rocks, Câche Lake, Algonquin Park, July 12th, 1900. (*Macoun.*)

15. CYNODONTIUM, Schimp.

57. **C. Schisti,** (Wahlb.) Lindb.

On earth about ledges of rock, Lake Lindeman, Yukon, 1899. (*Williams.*)

62. **C. polycarpum, Schimp.**

On damp rocks, at Câche Lake and Brulé Lake, Algonquin Park, 1900. (*Macoun.*) On rocks at Seal Lake and Fort Chimo, Labrador, 1896. (*A. P. Low.*) Common on rock on Upper Dyea Creek, Alaska ; also just over the Coast Range on streams flowing into Lake Lindeman, Yukon, 1899. (*Williams.*)

Subsp. **fallax,** Limpr.

On rocks, Newfoundland. (*Waghorne.*)

63. **C. strumiferum,** Ehrh.

Specimens collected on the North Arm of Burrard Inlet, B.C. and on Salt Spring Island, Gulf of Georgia, belong here though placed under *C. polycarpum* in the Cat. Can. Musci, page 17. On damp rocks near Victoria, Vancouver Island, May, 1893 (*Macoun.*) Clearwater Lake, Labrador, 1896. (*A. P. Low.*) Lake Lindeman, Yukon, in crevices of rock. (*Williams.*)

965. **C. torquescens,** (Bruch.) Limpr.

On thin earth over rock, Lake Lindeman ; on rock at Dawson, Yukon, 1899. (*Williams.*)

ONCOPHORUS, Brid.

64. **O. virens,** Swartz.

Cynodontium virens, Schimp. Cat. Can. Musci., Pt. VI., 17.

On earth at Fort Chimo, Hudson Strait, 1896. (*A. P. Low.*) On earth near Fort Assiniboine, Athabasca River, Sept. 1872. ; on old logs, Jumping Pound Creek, Alta., Rocky Mountain, 1897. (*Macoun.*) About springs between lakes Lindeman and Bennett, Yukon, 1899. (*Williams.*)

Var. **serratus,** (B. & S.) Limpr.

On earth along streams flowing into Lake Lindeman, Yukon, 1899. (*Williams.*)

Var. **nigrescens,** (SCHIMP.) WILLIAMS.

A depressed blackish variety growing on the margin of an alpine pond just below snow banks about 1,000 feet above Lake Lindeman, Yukon, 1899. (*Williams.*)

65. **O. Wahlenbergii,** BRID.

Cynodontium Wahlenbergii, (Brid.) Can. Cat. Musci., Part VI., 18.

Dr. Bell's specimen from Hudson Strait, belongs here and not to *O. virens*. On decaying logs at Margaree, and on sand, Half Way Brook, Cape Breton Island, N.S., 1898 ; on old logs near Hull and Meech's Lake, Que. (*Macoun.*) On old logs at Kingston, Ont., 1881. (*Prof. Fowler.*) On earth, Fort Chimo, Labrador, 1896. (*A. P. Low.*) Abundant on dead sticks and rotten wood, Câche Lake, Algonquin Park, June, 1900. (*Macoun.*) Common about Dawson, Yukon, on old stumps and logs in fine tufts up to 6 cm. high. (*Williams.*)

16. DICHODONTIUM, Schimp.

66. **D. pellucidum,** SCHIMP.

On earth, Port Etches, Lat. 60° 30′, Alaska, 1892 ; Unalaska, Behring Sea, 1891. (*J. M. Macoun.*) On wet rocks, Louisburg, Cape Breton Island, N.S., 1898 ; shore of Shawnigan Lake, Vancouver Island, 1893. (*Macoun.*)

Subsp. **fagimontanum,** BRAITHW.

Rocks of Portage River, near the Columbia, Rocky Mountains, No. 108. (*Drummond.*)

67. **D. flavescens,** (DICKS.) LINDB.

The specimens appearing under this species in Part VI. are now divided between this and the next, as below.

Mount Albert, Gaspé Co., Que., and at Forteau, Labrador, Lat. 57°. (*J. A. Allen.*) Port Etches, Alaska, Lat. 60° 30′, June 18th, 1892. (*J. M. Macoun.*) Shore of Shawnigan Lake, near Victoria, and on a bank by the sea at Comox, Vancouver Island, 1893. (*Macoun.*)

966. **D. subflavescens,** KINDB. in Hedwigia, 1896, 59.

Leaves channelled from suboblong base tapering to an attenuate acumen, serrate often to below the middle, long distant

nearly smooth ; cells and costa as in the last. Capsule symmetric, erect ; teeth nearly purplish ; pedicel low, pale red. Perichetial leaves narrower than the others, long-acuminate and generally subulate ; the upper part of the acumen nearly filled by the percurrent or excurrent costa. Perigonial leaves large and long-acuminate. Leaves of male plants sometimes obtuse. Tufts very tomentose up to the green tips. Often tall.

On wet rocks, Telegraph Trail, west of Fraser River, Lat. 54°, B.C., June 10th, 1875 ; on wet clay soil in a railway cutting at Hastings, near Vancouver, B.C., April, 1889 ; on wet rocks, Goldstream and Nanaimo, June, 1893, and on Mount Arrowsmith, Vancouver Island, July 17th, 1887 ; alt. 5,500 feet. (*Macoun.*)

17. TREMATODON, Michx.

68. T. ambiguus, Hedw.

On earth in woods at Baddeck, and by the roadside, Louisburg, Cape Breton Island, N.S., 1898 ; on wet earth at Casselman, South Indian and Ottawa, Ont., 1892 ; very common on old lumber roads, Algonquin Park, Ont, June, 1900. (*Macoun.*)

967. T. acicularis, Kindb., Revue Bryol, 1896.

Leaves broadly suboval, truncate above, pointed by the *excurrent* costa ; perichetial leaves nearly similar but larger and longer. Peristomial teeth orange, split in the middle ; basal tube red.

On the border of a bog at Craigellachie, Eagle River, B.C., July 18th, 1889. Included in *T. ambiguum* in Part VI. p. 19. (*Macoun.*)

19. DICRANELLA, Schimp.

71. D. crispa, (Elph.) Schimp.

Juneau, Alaska. (*Miss G. Cooley.*) On damp, sandy soil at the mouth of Bonanza Creek, Yukon, 1899. (*Williams.*)

72. D. Grevilleana, Schimp.

On earth in a ravine at Woodstock, N.B., July 4th, 1899. (*Macoun.*)

74. D. squarrosa, Starke.

In springy places in a ditch by the roadside summit of Smoky Mountain, Cape Breton Island, N.S., 1898 ; in a boggy place

near the summit of Castle Mountain, Rocky Mountains, 1885; in wet springy places south of the canal, along the railway, west of Dow's swamp, Ottawa, Ont., July 6th, 1900. (*Macoun.*)

75. **D. cerviculata,** SCHIMP.

On wet calcareous earth at Louisburg, Cape Breton Island, N.S., 1898. (*Macoun.*) On earth, Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

968 **D. polaris,** KINDB., Note on Canad. BRYOL. 1893.

Differs from *D. cerviculata,* in that the plants are smaller, the leaves shorter and nearly straight, and not flexuous; upper cells suboblong; costa broader, filling the whole acumen. Capsule very small and not striate, and less distinctly strumose; teeth nearly entire or faintly cleft. Stem very short.

On earth, St. Lawrence Island, Behring Sea, Aug. 15th, 1891. (*J. M. Macoun.*)

969. **D. cerviculatula,** KINDB., Note on Canad. BRYOL. 1893.

Differs from *D. cerviculata* by its leaves being gradually narrowed, its cells short-quadrate, only the inner basal being narrow; costa narrow and well defined, only in the perichetial leaves being distinctly excurrent. Tufts dark green.

Capsule strumose, finally plicate, generally erect and symmetric; teeth and pedicel as in *D. cerviculata.*

On rocks, Nottingham Island, Hudson Strait, Aug. 24th, 1884. (*Dr. R. Bell.*) In crevices of overhanging damp rocks, Half Way Brook, Cape Breton Island, N.S., Aug. 6th, 1898. (*Macoun.*) The latter specimens were in fine fruit.

76. **D. varia,** (HEDW.) SCHIMP.

Below Lake Lebarge on Thirty-Mile River, Yukon, 1899. (*Williams.*) In a railway cutting at Goldstream, Vancouver Island, June 2nd, 1893. (*Macoun.*)

79. **D. subulata,** (HEDW.) SCHIMP.

Growing on wet earth Clearwater Lake, Labrador, 1896. (*A. P. Low.*) Wet earth, Rainy Lake, Algonquin Park, Ont., June, 1900. (*Macoun.*) Growing on a thin layer of damp earth over rock at Lake Lindeman, Yukon, 1899. (*Williams.*)

80. **D. heteromalla,** SCHIMP.

On earth at Carmanah Point, south coast of Vancouver Island. (*J. M. Macoun.*) On earth in woods at Baddeck, Margaree and Louisburg, Cape Breton Island, N.S., 1898; on earth, in Algongonquin Park, Ont., June, 1900; in Stanley Park, Vancouver City, B.C. (*Macoun.*) On knolls in woods, Credit Forks and Edmonton, Ont. (*Jas. White.*) Juneau, and at Gold Creek Cañon, near Juneau, Alaska. (*Miss G. Cooley.*) Sheep Creek, Dyea Creek, Alaska, 1899. (*Williams.*)

DICRANUM, Hedw.

82. **D. fulvellum,** (DICKS.) SMITH.

On rock at Long Lake, a few miles below Chilcoot summit, Yukon, 1899. (*Williams.*)

83. **D. molle,** WILS.

On rocks, Labrador coast, Hudson Strait, Aug. 2nd, 1897. (*A. P. Low.*) Collected at Lindeman on damp clayey soil subject to overflow, Yukon, 1899. This species has been previously collected outside of Europe in Alaska and Greenland. (*Williams.*)

970. **D. falcatum,** HEDW.

Sterile plants collected on rock at Lake Lindeman, Yukon, 1899. (*Williams.*)

84. **D. Starkei,** WEB. & MOHR.

On Mount Queest, Gold Range, B.C., alt. 6,000 feet, 1889. Referred in Cat. Can. Musci to *D. Muehlenbeckii.* (*J. M. Macoun.*) On rocks, summit Lake Manicuagan River, Que., 1895. (*A. P. Low.*)

85. **D. Blyttii,** BRUCH & SCHIMP.

On rocks, at the Hot Springs, Kootenay Lake, B.C., alt. 4,500 feet, July 9th, 1890. (*Macoun.*) Rather common on rocks about Lake Lindeman, Yukon, 1899. (*Williams.*)

971. **D pumilum,** SAUTER.

On rocks, coast of Labrador. (*Waghorne.*)

86. **D. strictum,** SCHLEICH.

On old logs in the Crow's Nest Pass, Rocky Mountains, alt. 4,000 feet, 1897. (*Macoun.*)

87. **D. montanum,** HEDW.

On rotten logs in swamps at Edmonton, Ont., 1892. (*Jas. White.*) On sandy soil, Sable Island, N.S., July, 1899 ; barren ; abundant and fruiting on the bases of trees, Algonquin Park, Ont., June, 1900. (*Macoun.*)

88. **D. fulvum,** HOOK.

On boulders in the Big Intervale, Margaree, Cape Breton Island, N.S., 1898 ; very abundant on boulders and in fine fruit near Eel River, N.B., Aug., 1899. (*Macoun.*)

89. **D. viride,** SCHIMP.

Bases of beech trees, Edmonton, Ont. (*Jas. White.*) On damp earth at the base of trees, Big Intervale, Margaree, Cape Breton Island, N.S., 1898 ; on trees at Agassiz, B.C., May, 1889. This was named var. *grosiferum* by Kindberg. On trunks, Algonquin Park, Ont., June, 1900 ; on the bases of trees in woods, Southampton, Ont., Aug., 1901. (*Macoun.*)

Var. **læve,** Ren. & Card., Botanical Gazette, Vol. XXX., p. 15.

A forma typica habitu multo laxiore foliusque minus congestis dorso lævibus distincta.

On old stumps, Bay of Islands, Newfoundland, 1895. (*Waghorne.*)

972. **D. serratum,** KINDB.

On boulders at Câche Lake, Algonquin Park, Ont., June 8th, 1900. (*Macoun.*)

90. **D. flagellare,** HEDW.

On rotten logs at Edmonton, Ont., 1892. (*Jas. White.*) On old logs in woods at Baddeck, and at Louisburg, Cape Breton

Island, N.S., 1898; on old logs, Algonquin Park, Ont., June 1900; on old logs in woods, Jordan Station, Lincoln Co., Ont., May, 1901. (*Macoun.*)

92. **D. Grœnlandicum,** BRID.

In boggy ground, Clearwater Lake, Labrador, Aug. 2nd, 1896. (*A. P. Low.*) Capstan Island, Labrador, 1894. (*Waghorne.*)

93. **D. subulifolium,** KINDB.

On old logs in a ravine at Woodstock, N.B., July 3rd, 1899. (*Macoun.*)

973. **D. Howellii,** REN. & CARD., Bot. Gaz. 1889.

Leaves with a sublinear acumen, in the upper half serrulate, narrower than in *D. majus*; cells as in *D. majus*; costa not distinctly excurrent and nearly smooth. Capsule sulcate, solitary. Inner perichetial leaves entire, attenuate to an awn. Tufts often golden yellow.

On earth, Chilliwack Valley, B.C., 1901; Port Etches, Alaska, Lat. 60° 30′, 1892; Unalaska Island, Behring Sea, 1891; Nagai Island, Shumigan Group, Alaska, 1892, and Middleton Island, Alaska, Lat. 59° 30′, 1892. (*J. M. Macoun.*) On earth and rocks, Texada Island, Gulf of Georgia, 1885. (*Dr. G. M. Dawson.*) On earth in woods, Craigellachie, B.C., 1889; on rocks, North Arm, Burrard Inlet, B.C., 1889; abundant at Victoria (1887) and at Comox (1893), Vancouver Island, B.C. (*Macoun.*)

Subsp. **angustifolium,** KINDB., Bryol. N. Am. & Eur. p. 198.

Capsule not sulcate. Leaves nearly entire. On rocks, Burnside road, near Victoria, Vancouver Island, May 5th, 1893; on old logs, Comox, V.I., June 19th, 1893. (*Macoun.*) Nagai Island, Shumigan Group, Alaska, September, 1892. (*J. M. Macoun.*)

95. **D. sulcatum,** KINDB.

Newfoundland. (*Waghorne.*) On earth in woods, Big Intervale, Margaree, and on rocks at Half-way Brook, Cape Breton Island, N.S., 1898; on old logs, Câche Lake, Algonquin Park, Ont., June, 1900; on earth in woods at Revelstoke, B.C., May 6th, 1890; on logs at Parson's Mountain, Victoria, Vancouver

Island, 1893. (*Macoun.*) On logs, Carmanah Point, south coast of Vancouver Island, 1892; on earth, Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

96. **D. crispulum,** C. M. & KINDB.

On logs in woods at Baddeck, and on rocks, Big Intervale, Margaree, and Half-way Brook, Cape Breton Island, N.S., 1898; on earth in woods, Câche Lake, Algonquin Park, Ont., June, 1900. (*Macoun.*)

98. **D. majus,** SMITH.

On earth in woods at Baddeck, Margaree, and Half-way Brook, Cape Breton Island, N.S.; rather common, 1898. (*Macoun.*) Sitka, Alaska. (*Miss G. Cooley.*)

Var. **orthophyllum,** AL. BR.

This variety with nearly straight erect-spreading leaves bears little resemblance to the beautifully falcate-leaved *majus*. Fruiting specimens collected at Lake Lindeman, Yukon, 1899. (*Williams.*)

99. **D. scoparium,** HEDW.

A very common species on Cape Breton Island, N.S. Specimens were collected at Baddeck along the north shore and on Smoky Mountain, 1898; on earth, Sable Island, N.S., July, 1899; abundant in Algonquin Park, Ont., June, 1900. (*Macoun.*) On rocks, Credit Forks, Ont., 1893. (*Jas. White.*) Loring, also at Salmon Creek, near Juneau, Alaska. (*Miss G. Cooley.*)

Subsp. **involutum,** KINDB., Bryol. N. Am. & Eur. p. 196.

Leaves falcate not at all or sparingly porose, very concave, subconvolute in the middle very chlorophyllose, sometimes undulate; cells generally oblong-oval. Capsules unknown.

On rocks near the sea, Victoria Arm, near Victoria, Vancouver Island, May 13th, 1893. (*Macoun.*)

974. **D. consobrinum,** REN. & CARD.; KINDB., Bryol. N. Am. & Eur. p. 193.

Differs from *D. Canadense*; leaves shorter, perichetial leaves short-aristate, often emarginate; capsules smooth, often in pairs.

On earth in woods at Belleville, Hastings Co., Ont., Aug., 1867, referred to *D. scoparium*, var. *orthophyllum* at the time; also on roots of trees, Pirates' Cove, Strait of Canso, N.S., July 7th, 1883; not uncommon on earth on the old land, Sable Island, N.S., July and August, 1899. (*Macoun.*)

101. **D. congestum,** Brid.

Apparently quite common on Cape Breton Island, N.S., collected on old logs at Baddeck, Margaree, Half-way Brook and Louisburg, but always barren, 1898; on rocks, Câche Lake, Algonquin Park, Ont., June, 1900. (*Macoun.*) On swampy ground at Dawson, Yukon, 1899. (*Williams.*)

102. **D. fuscescens,** Turn.

On earth, Clear water Lake, Labrador. (*A. P. Low.*) In Lat. 61° Long. 104, W. on barren grounds west of Hudson Bay, July 24th, 1893. (*J. B. Tyrrell.*) On rotten logs at Edmonton, Ont., Sept. 22nd, 1892. (*Jas. White.*) On old logs, Algonquin Park, Ont., June, 1900; on rocks and logs in woods at Victoria, Vancouver Island, May 1893. (*Macoun.*) Sitka, Alaska. (*Miss G. Cooley.*) On rock along Dyea Creek, Alaska; and on earth, Lake Lindeman, Yukon. *Williams.*)

Subsp. **subbrevifolium,** Kindb., Bryol. N. Am. & Eur. p. 198.

Leaves larger. subconvolute, nearly entire; costa not excurrent. Capsule sulcate. Stem rather tall. Habit of *D. brevifolium*, Lindb.

On rocks at Hector, and at the head of Lake Louise, Rocky Mountains, Aug. 18th, 1891. Referred to *D. brevifolium* in Part VI., p. 260. (*Macoun.*)

975. **Dicranum Demetrii,** Ren. & Card., Botanical Gazette, Vol. XXII., p. 48.

In very compact, yellowish-green tufts, brownish and a little tomentose below. Stems erect, simple or sparingly branching, three to four inches long. Leaves crowded, erecto-patent when moist, crispate when dry, from an oblong-obovate base rather suddenly constricted and linear-subulate, canaliculate, smooth, quite entire or subsinuate at apex, 3-6 mm. long, 0.30-0 60 mm. broad at base; costa narrow, percurrent or subexcurrent; cells

smooth, small, quadrate or short-rectangular and incrassate in the upper part, becoming narrowly linear and slightly porose toward the base near the costa, the alar looser, subrectangular. Perichætial leaves from an oblong sheathing base suddenly long-cuspidate. Fruit unknown. Seems dicœcious.

Seems to have some affinities with *D. elongatum* Schw., but is readily distinguished at first sight from this species by its leaves being crisped in a dry state, which gives it rather the appearance of *D. montanum*, Hedw., and also by the very different areolation of the leaves.

Rattler's Bight, Labrador, 1892. (*Waghorne.*)

976. **D. trachyphyllum,** Ren. & Card., Botanical Gazette, Vol. XXII. p. 48.

Dicœcious. Cespitose, green or olivaceous. Stems erect; 2-6cm. long, simple or branching, sparingly tomentose in the lower part. Leaves falcate or flexuous-patent when moist, flexuous-crisped when dry, often tufted, linear-lanceolate, canaliculate above and rather thickly subulate, strongly serrate on the margins, spinulose-dentate at apex; costa stout; about one-fourth of the width of leaf-base, generally very rough at back, percurrent or short-excurrent into a spinulose-dentate point; cells of the upper part quadrate or subrotundate, mostly papillose on the back, oblong or linear and smooth toward the base, the alar lax, inflated or hyaline. Perichetial leaves from an oblong sheathing base constricted into a long subula; costa narrower. Pedicels pale, at last twisted to the left above when dry. Capsule and peristome as in *D. fuscescens.*

Closely allied to *D. fuscescens*, Turn., to which it might be subordinated as a sub-species, but nevertheless easily distinguished by the leaves being more strongly serrate, very rough on the back, less narrowly subulate and the nerve thicker and broader.

Leading Tickle and Hermitage Bay, Newfoundland, 1893 and 1895. (*Waghorne.*)

103. **D. Muehlenbeckii,** Bruch & Schimp.

On stumps at Fox River, Gaspé Co., Que., Aug. 3rd, 1882; on roots of trees, Lake Nipissing, Ont. Both these specimens were referred to *D. fuscescens* in Part VI., 29; on earth along Jumping Pound Creek, Rocky Mountains, 1897. (*Macoun.*) Growing

amongst boulders at Lake Lindeman, Yukon, 1899. (*Williams.*) On rock, Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

105. **D. Canadense,** KINDB.

On earth in wet woods at Baddeck, Margaree and Half Way Brook, Cape Breton Island, N.S., 1898. Rather common and with the general appearance of the species but the capsule always single. On old logs at Belleville, Ont., May 26th, 1874 ; on earth in woods, White Trout Lake Algonquin Park, Ont., 1900. (*Macoun.*) On rotten logs at Edmonton. Ont., Sept., 1892. (*Jas. White.*)

977. **D. camptophyllum,** KINDB., BRYOL. N. Am. & Eur. p. 193.

Leaves tapering to a long subulate point, in the upper half of the acumen strongly serrate, falcate and not crisped when dry; cells not porose ; those of the acumen subquadrate, the alar cells yellow, dilated, subrectangular, reaching to the costa; other basal cells long. Perichetial leaves obtusate or abruptly tapering to a generally longer, narrow-subulate or subfiliform awn with a long-excurrent costa. Capsule solitary, not sulcate. Tufts green above.

Clearwater Lake, northern Labrador, July 21st, 1896. (*A. P. Low.*)

Var. **poriferum,** KINDB.

On old logs along Bragg's Creek, Elbow River, Rocky Mountains, Alta., June 22nd, 1897. (*Macoun.*)

978. **D. algidum,** KINDB., Revue Bryol. 1896.

Leaves entire, nearly straight and suberect, only the upper flexuous, narrower than in *D. fuscescens ;* angular cells nearly uniform dilated ; other cells very porose, and generally long; costa very narrow, nearly smooth at the back or slightly rough in the excurrent part. Tufts soft and silky, green or dark green, nearly eradiculose. Capsules unknown. Habit of *D. spadiceum;* differs from it principally in not having convolute leaves.

On damp rocks, Lake Agnes, Rocky Mountains, Alta., Aug. 19th, 1891, alt. 7,500 feet. (*Macoun.*)

979. **D. subspadiceum,** KINDB., BRYOL. N. Am. & Eur. 199.

Leaves straight, erect, subconvolute, denticulate near the apex and at the excurrent part of the costa. Tufts brown with yellowish branching tops. Capsules unknown.

On Mount Aylmer, Devil's Lake, Banff Park, Alta., alt. 8,000 feet, Aug. 6th, 1891 ; on earth at Hector, Rocky Mountains, B.C., July 28th, 1885. (*Macoun.*)

107. **D. elongatum,** SCHW.

Near Fort Norman, Mackenzie River, July, 1892. (*Miss E. Taylor.*) On the summit of Mount Albert, Gaspé Co., Que., July 25th, 1881. (*J. A. Allen.*) On the Barren Grounds, Lat. 61°, Long. 104, W., west of Hudson Bay, July, 1893. (*J. B. Tyrrell.*) Along the Athabasca River, above Athabasca Landing, May 28th, 1888. (*J. M. Macoun.*) On earth, Mosquito Bay, Lat. 60° 42′, Labrador, Aug. 13th, 1898. (*A. P. Low.*) St. Paul Island, Behring Sea. (*Dr. Merriam.*) Very common on both old stumps and rocks in damp places at Dawson, Yukon, 1899. (*Williams.*)

Subsp. **attenutaum,** KINDB., BRYOL. N. Am. & Eur. p. 201.

Leaves larger, gradually tapering to a somewhat long subula, nearly entire and often somewhat brittle, the uppermost flexuous; costa short-excurrent. Capsule more or less curved. - Habit of *D. fragilifolium.* Tufts low.

Labrador. (*Waghorne.*) On earth along Jumping Pound Creek, Rocky Mountains, Alta., June 12th, 1897. (*Macoun.*)

Subsp. **subfragilifolium,** KINDB., BRYOL. N. Am. & Eur. p. 201.

Leaves narrow, long-subulate, faintly denticulate above, flexuous, sometimes brittle ; costa long-excurrent, narrow. Capsule arcuate.

Newfoundland. (*Waghorne.*)

109. **D. fragilifolium,** LINDB.

On decayed wood along the Athabasca River above Athabasca Landing, May 28th, 1888 ; on old logs, Chilliwack Valley, B.C.; 1901. (*J. M. Macoun.*) Along Bragg's Creek, Elbow River, Rocky Mountains, Alta., June 22nd, 1897. (*Macoun.*) Very

common on decayed logs about Dawson, Yukon, 1899. (*Williams.*)

110. **D. longifolium,** HEDW.

On dry granite boulders in the Parry Sound District, Ont., May, 1893. (*Jas. White.*) On logs and rocks, Big Intervale, Margaree, on earth, sand and rocks, very common, at Half Way Brook, Cape Breton Island, N.S., July, 1898 ; also on boulders at Meech's Lake, near Chelsea, Que., 1893.

Var. **subalpinum,** MILDE.

On rocks, Blackwater River, Lake Nipigon, Ont., July, 1884 ; on rocks at Sudbury Junction, Ont., 1884 ; on rocks 5 miles below Hector, Rocky Mountains, B.C., Aug., 1890. (*Macoun.*)

112. **D. Bonjeani,** DE NOT.

On earth in woods, Queenston Heights Ont., May 11th, 1901 ; on damp earth, Pelee Point, Essex Co., Ont., May 29th, 1901 ; in wet woods, Camlachie, Lambton Co., Ont., June 18th, 1901. The latter specimens in fine fruit. (*Macoun.*) On rather dry ground at Lake Lindeman, Yukon, 1899. (*Williams.*)

980. **D. Rœllii,** KINDB. in Hedwigia, 1896, p 60.

Differs from *D. Bonjeani*, in the leaves neither spreading nor undulate, and their costa sometimes bilamellate. More nearly allied to *D. scoparium*, but differs from it in the leaves being faintly crenulate at the acumen, their upper cells suboblong, less porose ; costa shorter, and nearly smooth at the back.

Collected on Vancouver Island by J. Rœll. On rocks, Cadboro Bay, near Victoria, Vancouver Island, May 31st, 1893. (*Macoun.*)

981. **D. angustum,** LINDB.; Card. & Ther. Bot. Gaz., Vol. XXX., p. 15.

A polar moss, known only from some localities of North Finland and Siberia. It is easily distinguished from *D. Bonjeani*, De Not., by the leaves being straight, not undulate, convolute, and entire, and by the thinner costa, the less porose cells, and the perichætial leaves long-piliferous.

A few stems found amongst *Aulacomnium turgidum*, northwest shore of Hudson Bay Lat. 63° 55′, 1893-1894. (*G. Comes.*) Sterile

specimens collected at Lake Lindeman in swamps, and found in good fruit at Dawson, Yukon, in July, 1899. (*Williams.*)

114. **D. subpalustre,** C. M. & KINDB.

Abundant on earth on all the old land, Sable Island, N.S., Aug., 1899. In all cases it was barren. (*Macoun.*)

115. **D. Bergeri,** BLAND.

In a bog, Clearwater Lake, Labrador, 1896; Mosquito Bay, Labrador, Lat. 60° 42′, 1898. (*A. P. Low.*) In a bog, Barren Grounds, Lat. 61° Long. 104°, west of Hudson Bay, 1893. (*J. B. Tyrrell.*) On earth in a boggy place Half Way Brook, Cape Breton Island, N.S., Aug., 1898; on earth, Sable Island, N.S., 1899; also at Catfish Lake and Rainy Lake, Algonquin Park, Ont., 1900; on logs and earth in bogs, Jumping Pound Creek; and on the slope of Mount Forget-me-not, Rocky Mountains, July, 1897; in peat bogs north of the Saskatchewan at Prince Albert, Sask., July, 1896. (*Macoun.*) Lake Lindeman, mouth of Little Salmon River and near Dawson, Yukon, 1899. (*Williams.*)

Subsp. **rupincola,** KINDB. Bry. Am. & Eur, p. 193.

Leaves subulate-acuminate; costa percurrent, serrulate at the back; perichetial leaves long, aristate, not emarginate.

On rocks three miles below Hector, Rocky Mountains, B.C., Aug. 13th, 1890. This specimen was referred to *D. spadiceum* in Cat. Can. Musci, Pt. VI., 260. (*Macoun.*)

982. **D. pallidum,** BRUCH & SCHIMP.

Newfoundland. (*Waghorne.*)

116. **D. Drummondii,** C. MUELL.

Quite common and in fine fruit in woods throughout Algonquin Park, Ont., June, 1900; in rocky woods, Johnstone's Harbour, Bruce Peninsula, Ont., Aug. 22nd, 1901. (*Macoun.*)

117. **D. undulatum,** TURN.

In boggy woods at Edmonton, Ont., 1892. (*Jas. White.*) On earth in woods at Baddeck, Cape Breton Island, N.S., July, 1898; in swampy woods, Câche Lake, Algonquin Park, Ont., June, 1900. (*Macoun.*)

Subsp. **Ontariense,** KINDB.

Leaves less spreading, not recurved, strongly serrate only in the upper part of the acumen, capsule solitary.

The specimen on which this form is based was collected in thick woods at Wooler, Northumberland Co., Ont., Oct. 6th, 1888, and referred in Part VI., 28 to *D. majus.* (*Macoun.*)

118. **D. spurium,** HEDW.

On dry rocks, Halfway Brook, Cape Breton Island, N.S., Aug., 1898; common on sandy earth, Sable Island, N.S., Aug. 8th, 1899. (*Macoun.*)

983. **D. condensatum,** HEDW.

On dry sandy earth and almost pure sand at the bases of trees. Pelee Point, Essex Co., Ont., May 27th, 1901; quite common. (*Macoun.*)

936. **D. spadiceum,** ZETT.

On rocks or earth, Greenland. (*Berggren.*) On rocks, Mosquito Bay, Lat. 60° 42′, Labrador, Aug., 1898. (*A. P. Low.*)

984. **D. Sphagni,** WAHLENBERG.

Newfoundland. (*Waghorne.*) On earth in a bog, Clearwater Lake, Labrador, July 31st, 1896. (*A. P. Low.*) Along Jupiter River, Anticosti, Que., Aug. 20th, 1883, included in Part VI. under *D. Bergeri.* (*Macoun.*)

22. DICRANODONTIUM, Bruch & Schimp.

122. **D. longirostre,** BRUCH. & SCHIMP. Can. Cat. Musci, p. 35.

On damp earth on rocks at Louisburg, Cape Breton Island, N.S., Aug. 18th, 1898. (*Macoun.*) Along the Tay, York Co., N.B. (*J. Brittain.*) On earth, Port Etches, Alaska, June 18th, 1892. (*J. M. Macoun.*)

23. CAMPYLOPUS, Brid..

123. **C. Schimperi,** MILDE.

Leptotrichum tomentosum, Kindb. Note on Can. Bryol.

On rocks, St. Paul Island, Behring Sea, July 3rd, 1892. (*J. M. Macoun.*)

24. FISSIDENS, Hedw.

124. F. bryoides, Hedw.

On earth on a bank at Edmonton, Ont., Sept., 1892. (*Jas. White.*) On earth at Owen Sound, July, 1874, referred to *F. tamarindifolius* in Cat. Can. Musci, Pt. VI., 36. (*Macoun.*) Common on earth about Dawson, Yukon, 1899. (*Williams.*)

Var. **viridulus,** Swartz.

Fruiting stems without male flowers.

In woods at Comox and Victoria, Vancouver Island, June, 1893. (*Macoun.*)

125. F. incurvus, Schwæger.

On stones in a dry brook at Edmonton, Ont., Aug. 1893. (*Jas. White.*) By a roadside at Comox, Vancouver Island, June, 1893. (*Macoun.*)

127. F. limbatus, Sulliv.

On the bank of a stream at Sicamous, B.C., July 3rd, 1889. Referred in Cat. Can. Musci, Pt. VI., 37, to *F. osmundoides.*

131. F. osmundoides, (Sw.) Hedw.

On earth on rock, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898; on dead cedar roots, Island Lake, Algonquin Park, Ont., July, 1900. (*Macoun.*) On earth and rocks at Lake Lindeman, Yukon, 1899. (*Williams.*)

132. F. adiantoides, (Linn.) Hedw.

In a ravine at Whycocomagh, Cape Breton Island, N.S., July, 1883; on the shore of Shanigan Lake, Vancouver Island, 1893; on earth on rocks, Foster's Flats, Niagara River, Ont., May 16th, 1901. (*Macoun.*) In marshy places at Lake Lindeman, Yukon, 1899. (*Williams.*)

Var. **immarginatus,** Lindb.

In boggy soil, Jupiter River, Anticosti, Que., Aug., 1883. (*Macoun.*) On earth, Battle Harbour, Labrador; and Newfoundland. (*Waghorne.*) Within the spray of Kakabeka Falls, west of Lake Superior, Sept. 1889. (*Mrs. E. G. Britton.*)

Var. **instatus,** KINDB.

On old stumps subject to flood along Lake Duchesne above Britannia, six miles above Ottawa, Ont., Oct., 27th, 1900. (*Macoun.*)

133. **F. decipiens,** DE NOT.

F. adiantoides, Linn. var. *cristatus*, Wilson.

On boulders at Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898; on boulders at Belleville, Hastings Co., Ont., Oct., 1888. Recorded as a new variety in Cat. Can. Musci, Pt. VI., 37. Drummond's No. 110 referred to *adiantoides* also belongs here. On the bases of trees, Sudbury Junction, Ont., May, 1884; on the bases of stumps in a swamp at Wyoming, Lambton Co., Ont., June 14th, 1901. (*Macoun.*)

134. **F. subbasilaris,** HEDW.

On wet ledges half way up Mount McKay, Fort William, Lake Superior, Sept. 7th, 1887. (*Mrs. E. G. Britton.*) On cedar bark in woods at Carleton Place, Ont., May 12th, 1900. (*Macoun.*)

135. **F. grandifrons,** BRID.

On submerged limestone rocks in the Credit River at Credit Forks, Ont., Sept. 17th, 1892. (*Thos. Walker. Jas. White.*) On wet limestone rocks in a spring close to the Niagara River at Foster's Flats, Ont., May 16th, 1901. (*Macoun.*)

985. **F. Garberi,** LESQ. & JAMES, Mosses of N. America, p. 86.

On old stumps, subject to flood, along Lake Duchesne, above Britannia, six miles above Ottawa, Ont., Oct. 27th 1900. (*Macoun.*)

986. **F. Ravenelii,** SULLIV.; Lesq. & James Mosses of N. America, p. 85.

On earth in woods, Owen Sound, Ont., Sept. 14th, 1890. *Macoun.*) Referred to *F. incurvus* in Part VI., p. 36.

26. LEUCOBRYUM, Hampe.

137. **L. vulgare,** HAMPE.

On Stony Lake, Peterboro', Co. Ont., Aug. 16th, 1892. (*Thos. Walker.*) On earth in a ravine, Big Intervale, Margaree, Cape

Breton Island, N.S.; on earth, Sable Island, N.S., July, 1899; Câche Lake, Algonquin Park, Ont., June, 1900; in woods Jordan Station, Lincoln Co., Ont.; woods, Queenston Heights, Ont.; on Pelee Point and Beach Ridge, Leamington, Essex Co., Ont., 1901. (*Macoun.*)

27. CERATODON, Brid.

138. **C. purpureus,** Brid.

On earth in woods and by roadsides, Cape Breton Island, N.S., July, 1898; on earth, Sable Island, N.S., July, 1899; quite common on the eastern slope of the Rocky Mountains, 1897. (*Macoun.*) Fort Chimo, Labrador, Aug., 1896. (*A. P. Low.*) On earth at Edmonton, Ont., May, 1892. (*Jas. White.*) On earth, Baffin Land, north shore of Hudson Strait, July, 1897. (*Dr. R. Bell.*) Juneau, also at Salmon Creek and Gold Creek Cañon near Juneau, Alaska; and at Nanaimo, Vancouver Island. (*Miss G. Cooley.*) Common on rock at Lake Lindeman, Yukon, 1899. (*Williams.*)

987. **C. Columbiæ,** Kindb., Revue Bryol., 1896.

Leaves narrowly ovate-lanceolate subulate-acuminate, reflexed below the somewhat long serrulate acumen; costa generally excurrent. Inner perichetial leaves, one or two, with a somewhat long-linear or lingulate acumen. Capsule curved when dry, teeth with numerous articulations, broadly margined; lid short-conic obtuse or sub-convex; predicel red. Outer perigonial leaves with long-excurrent costa. Monœcious.

On earth at Kicking Horse Lake, Rocky Mountains, July, 1885; in woods at Revelstoke, B.C., 1889. (*Macoun.*) On earth, Chilliwack River, B.C., 1901. (*J. M. Macoun.*)

139. **C. conicus,** Hampe.

This species includes *C. minor*, Austin, which was founded on specimens collected by the writer in 1875. See Cat. Can. Musci, Pt. VI., 39.

28. TRICHODON, Schimp.

141. **T. cylindricus,** Schimp.

On wet rocks, Half Way House, Cape Breton Island, N.S., August 5th, 1898. (*Macoun.*)

29. DISTICHIUM, Bruch & Schimp.

142. **D. capillaceum,** (SWARTZ.) BR. & SCH.

On rocks, Fort Chimo, Ungava Bay, Labrador, Aug., 1896. (*A. P. Low.*) On damp rocks in ravines at the Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898; in damp rocky places along Jumping Pound Creek, Rocky Mountains, June, 1897; on hummocks in bogs north of the Saskatchewan at Prince Albert, Sask., July, 1896. (*Macoun.*) On earth and rock from Lake Lindeman to Dawson, Yukon, 1899. (*Williams.*)

143. **D. inclinatum,** (EHRH.) BR. & SCH.

On earth at Lake Lebarge, and on old stumps at Dawson, Yukon, 1897. (*Williams.*)

30. SELIGERIA, Bruch & Schimp.

149. **S. campylopoda,** KINDB.

Quite common and in fine fruit on damp limestone rocks, Foster's Flats, Niagara River, Ont., May 16th, 1901. (*Macoun.*)

31. BLINDIA, Bruch & Shimp.

150. **B. acuta,** (HUDS.) BRUCH & SCHIMP.

On wet rocks at Half Way Brook, Cape Breton Island, N.S., Aug., 1898. (*Macoun.*) Juneau, alt. 3,000 feet; also at Salmon Creek and Gold Creek Canon, near Juneau, Alaska. (*Miss G. Cooley.*) In fine fruit at Skagway, Alaska; sterile specimens at lakes Lebarge and Lindeman, Yukon. (*Williams.*)

988. **B. flexipes,** (REN. & CARDT.) KINDB.

Leaves as in *B. acuta*, but often falcate; costa denticulate above, short-excurrent. Perichetial leaves gradually acuminate. Capsule as in *B. acuta;* pedicel flexuous arcuate, yellow above. Tufts green or yellowish green.

On damp rocks in a ravine at Goldstream, and on sandstone rocks, Union Mines, Comox, Vancouver Island, June, 1893. (*Macoun.*) On rocks at Carmanah Point Vancouver Island; on rock, Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

ERSITY OF CALIFORNIA

34. POTTIA, Ehrh.

154. **P. truncatula,** LINN.
Pottia truncata, Fuern. Cat. Can. Musci. 42.

On ground in open places at Edmonton, Ont., Nov. 5th, 1892. (*Jas. White.*)

157. **P. Heimii,** FUERN.

On earth, Farewell Creek, Cypress Hills, Assa., June 27th, 1895. (*Macoun.*)

158. **P. latifolia,** var. **pilifera,** (BRID.) MUELL.

On bare earth of the river bluff just below Dawson, Yukon, 1899. (*Williams.*)

35. DIDYMODON, Hedw.

160. **D. rubellus,** (HOFFM.) BRUCH & SCHIMP.

On earth and rocks, Half Way Brook, Cape Breton Island N.S., Aug., 1898 ; on rocks, Moose Mountain, Rocky Mountains Alta., June, 1897 ; in a ravine at Woodstock, N.B., July, 1899. (*Macoun.*) Cañon City, Dyea Creek, Alaska ; also common at Dawson, Yukon, 1899. (*Williams.*)

161. **D. Canadensis,** KINDB.

Newfoundland. (*Waghorne.*)

989. **D. subruber,** KINDB. Revue Bryol. 1896.

Leaves as in *D. rubellus*, but often dentate. Perichetial leaves long-subulate, not recurved. Capsule curved ; lid rostrate. Dioecious.

On rocks at Morley, Banff and "Dry Cañon," Devil's Lake, Rocky Mountains, Alta., Aug. 11th, 1891. (*Macoun.*)

162. **D. luridus,** HORNSCH.

On damp limestone rocks, Credit Forks, Ont., Sept., 1892. (*Jas. White.*)

990. **D. trachyneuron,** KINDB. BRYOL. N. Am. & Eur. 275.

Leaves short-attenuate, subacute, brittle ; costa pale, papillose at the back, sometimes excurrent. Tufts low, green. Capsules unknown.

On a large rock in a ravine at North Wakefield, Que., Sept. 12th, 1893. (*J. M. Macoun.*) On rocks at Owen Sound and Wiarton, Bruce Co., Ont., July, 1874. (*Macoun.*)

36. LEPTODONTIUM, Hampe.

165. **L. Canadensis,** KINDB.

In the Bryineæ of North America and Europe Dr. Kindberg re-describes this species and names it *Didymodon Macounii*, Kindb. Mrs. E. G. Britton in Bull. Torr. Bot. Club, Vol. XXVII., p. 648, shows that this species is identical with *Pottia riparius*, Aust. and *Trichostomum Warnstorfii*, Correns, while Dr. Kindberg brings them also together but makes two species out of the three keeping *Pottia riparius*, Aust. and *Trichostomum Warnstorfii*, Correns, under *Didymodon riparius*, Aust.

37. DITRICHUM, Timm.

LEPTOTRICHUM, Hampe.

991. **D. oblongum,** (LINDB.) KINDB.

On earth, Greenland. (*Berggren.*)

992. **D. giganteum,** R. S. WILLIAMS.

The author compares this species with large forms of *D. flexicaule* which approach it very closely. Sterile specimens, only, collected at Dawson, Yukon, 1899. (*Williams.*) Specimens of this species were collected by the "torrent" at Hector, Rocky Mountains, July 29th, 1885, and again on August 12th, 1890. These were referred to *flexicaule* in Part VI., Cat. Can. Musci., p. 46. (*Macoun.*)

166. **D. tortile** (GMEL.) LINDB.

On earth, Aroostook Falls, New Brunswick, Sept. 7th, 1899; on earth at South Indian, Carleton Place, Algonquin Park and Ottawa, Ont. (*Macoun.*)

Subsp. **pusillum,** HEDW.

Drummond's No. 118 and Prof. Fowler's specimen from New Brunswick referred to *tortile* in Cat. Can. Musci 45 belong here. Rather common by the roadside near the Mer Bleue, and at Rockcliffe, Ottawa, Ont. (*Macoun.*)

167. **D. vaginans,** (SULLIV.) HAMPE.

On earth by roadsides at Louisburg, Baddeck, Grand Narrows, and Margaree, Cape Breton Island, N.S., Aug. 1898. Rather common. (*Macoun.*)

168. **D. homomallum,** (HEDW.) HAMPE.

On earth by the roadside at Louisburg, Cape Breton Island, N.S., Aug. 18th, 1898. (*Macoun.*)

993. **D. elatum,** KINDB. Bryol. N. Am. & Eur. 181.
Leptotrichum flexicaule, var. *brevifolium*, KINDB. Cat. Can. Musci., 46.

169. **D. flexicaule,** (SCHLEICH.) HAMPE.

On rocks in a ravine, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898. (*Macoun.*) Common about Dawson, Yukon, in swampy places. (*Williams.*)

Subsp. **densum,** (SCHIMP.) KINDB.

On rocks in the Crow's Nest Pass, Rocky Mountains, Aug., 1897. (*Macoun.*) Collected between the Big and Little Salmon rivers, Yukon, in good fruit, June 16th, 1899. (*Williams.*)

994. **D. suboblongum,** KINDB.

On rocks, Moose Mountain, Elbow River, Rocky Mountains, June 30th, 1897; summit of Tunnel Mountain, Banff, Rocky Mountains, Alta., July 6th, 1891. (*Macoun.*)

170. **D. pallidum** (SCHRIEBER) HAMPE.

In woods near Niagara Falls, Ont., June 27th, 1892, on earth in woods at Leamington, Essex Co., Ont.; also at Jordan Station, Lincoln Co., Ont., 1901. (*Macoun.*)

995. **D. Schimperi,** LESQ.
Leptotrichum Schimperi, Lesq.; Lesq. & James, Mosses of N. America, 108.

On earth along Shawnigan Lake and by ditches at Comox, Vancouver Island, 1893. (*Macoun.*)

171. **D. glaucescens,** (Hedw.) Hampe.

On granite rocks, shore of Stony Lake, Peterboro' Co., Aug., 1892. (*Thos. Walker.*) On damp rocks, Algonquin Park, Ont., July 1900. (*Macoun.*)

38. TRICHOSTOMUM, Smith.

940. **T. Vancouvericense,** (Broth.) Kindb.

On earth in woods, near Victoria, Vancouver Island, May 6th, 1893. (*Macoun.*)

996. **T. anomalum,** Schimp.; Lesq. & James, Mosses of N. America, 110.

On earth in fields, Sea's farm, and on rocks Burnside Road, near Victoria, Vancouver Island, May, 1893. (*Macoun.*)

997. **T. indigens,** Ren. & Card., Botanical Gazette, Vol. XXII., p. 50.

Very small, gregarious, dirty green; stems scarcely 1—2 mm high. Leaves patent, subcirrate when dry, 1.25—1.75 mm. long, and oblong-lingulate, obtuse, apiculate or crenulate by the projection of the papillæ; costa stout, percurrent or vanishing just below the apex; cells minute, rotundate or subquadrate, densely papillose, becoming gradually larger, oblong, rectangular, pellucid and smooth toward the base. Perichetial leaves from an oblong and loosely reticulate base, linear-lingulate, obtuse or mucronate. Pedicel thin, reddish, paler above, 4—6 mm. long, slightly twisted to the left under the capsule when dry. Capsule small, erect, oblong-cylindrical, chestnut-colored, about 1 mm. long. Lid unknown. Annulus simple, teeth of the peristome purple, slightly twisting, on a narrow basilar membrane, segments filiform, minutely granulose, marked with a longitudinal line, articulate, slightly nodose and partly connected in the lower part. Probably dicœcious (male flowers unseen).

Resembling the smallest form of *Barbula unguiculata*, Hedw., by the shape and areolation of the leaves, but well distinct by the peristome being much shorter and less twisted, the teeth describing scarcely half a spiral turn.

Newfoundland, 1895. (*Waghorne.*)

39. DESMATODON, Brid.

173. **D. latifolius,** Brid.

On Unalaska Island, Behring Sea, Aug., 1891. (*J. M. Macoun.*) On earth at Lake Louise, Rocky Mountains, Alta., Aug., 1891. (*Macoun.*)

Var. **glacialis**, Schimp.; Lesq. & James, Mosses of N. America, 111.

Greenland. (*Berggren.*)

174. **D. Systylius,** Bruch & Schimp.

St. Paul Island, Behring Sea. (*Dr. Merriam.*)

175. **D. Porteri,** James.

On flat limestone rocks, Foster's Flats, Niagara River, May 11th, 1901. (*Macoun.*)

178. **D. cernuus,** Bruch & Schimp.

On earth at Dawson, Yukon, 1899. (*Williams.*)

998. **D. systilioides,** Ren. & Card., Botanical Gazette, Vol. XXX., p. 16.

A full description in Latin is given besides the following which is sufficient for our purpose.

By the lid attached to the columella and persistent after the opening of the capsule, this species resembles *D. Systilius*, Schimp., but is clearly distinct from it by the leaves of a more obscure and more papillose areolation, with a distinct pellucid yellowish border, the nerve stouter, brownish, not or very shortly excurrent, and by the total lack of peristome; at least none of the capsules we have been able to examine show the slightest trace of this organ. The pellucid border of the leaves shows some relationship between *D. systilioides*, Ren. & Card., and *D. Porteri*, James, but the latter has a much narrower capsule, with a highly conic lid not adhering to the columella, and the peristome and annulus are well developed.

L'Anse au Mort, Labrador, 1894. (*Waghorne.*)

41. BARBULA, Hedw.

185. **B. brevriostris,** Bruch & Schimp.

On earth-covered stumps and bare clayey soil about Dawson, Yukon, 1899. (*Williams.*)

187. **B. tortuosa,** (Linn.) Web. & Mohr.

On limestone rocks, Credit Forks, Ont., Sept., 1892. (*Jas. White.*) On dry earth, Moose Mountain, Elbow River, Rocky Mountains, Alta., June, 1897 ; on rocks in a ravine at Margaree, Cape Breton Island, N.S., July, 1898 ; abundant and fruiting on rocks, Aroostook Falls, N.B., Sept., 1899 ; on sand under trees, Pelee Point, Essex Co., Ont., 1901. (*Macoun.*)

188. **B. inclinatula,** C. M. & Kindb.

Sterile specimens collected on limestone rocks along the Niagara River, near Queenston, Ont., May 13th, 1901, are doubtfully referred here. (*Macoun.*)

189. **B. fragilis,** (Drumm.) Wils.

On earth, Jumping Pound Creek bridge, Alta., June, 1897. (*Macoun.*) On earth in damp shady places at Dawson, Yukon, 1899. (*Williams.*)

190. **B. cæspitosa,** Schwæger.

Abundantly fruiting at the bases of trees in woods, Pelee Point, Essex Co., Ont., May 27th, 1901 ; on the bases of old stumps in a swamp at Wyoming, Lambton Co., Ont., June 14th, 1901. (*Macoun.*)

200. **B. fallax,** Hedw.

On earth, Parson's Mountain, near Victoria, Vancouver Island, May 15th, 1893. (*Macoun.*)

201. **B. recurvifolia,** Schimp.

A specimen collected in the Crow's Nest Pass, Rocky Mountains, Aug. 20th, 1897, was named by Kindberg *B. reflexa*, var. *virescens*, or a new species. I place it here for the present. (*Macoun.*) Growing in large tufts on rocks at Dawson, Yukon, 1899. (*Williams.*)

205. **B. spadicea,** MITT.

On earth near the Indian village, Comox, Vancouver Island, June, 1893. (*Macoun.*)

206. **B. unguiculata,** (HUDS.) HEDW.

On earth in ditches at Baddeck, Cape Breton Island, N.S., July, 1898 ; not rare on earth at Queenston, Ont. (*Macoun.*)

207. **B. brachyphylla,** SULLIV. var. **angustifolia,** KINDB. (N. var.)

Leaves ovate-lanceolate, broadly acuminate, subobtuse, nearly smooth, slightly reflexed or partly flat at the borders, crowded, appressed when dry ; cells subpellucid, subquadrate ; costa red and thick, principally above, percurrent. Capsules unknown. On calcareous rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C., June 8th, 1890. (*Macoun.*)

213. **B. circinnatula,** C. M. & KINDB.

This is a common species on Vancouver Island on damp or wet rocks. It has been collected at Craigflower, Goldstream, along the Colquitz River and other places near Victoria, and at Sooke, 25 miles to the southwest of it, 1893. (*Macoun.*)

214. **B. horridifolia,** C. M. & KINDB.

On damp rocks in the Eagle Pass, Gold Range, B.C., May 23rd, 1890 ; on wet rocks, Colquitz River near Victoria, Vancouver Island, 1893. (*Macoun.*)

215. **B. convoluta,** HEDW.

All eastern references found under this species in Cat. Can. Musci, 57, belong here. All western to the next species.

On limestone rocks, Credit Forks, Ont., Sept., 1892. (*Jas. White.*) On earth at Queenston Heights, Ont., May 8th, 1901. (*Macoun.*)

216. **B. chysopoda,** C. M. & KINDB.

This species is quite common on Vancouver Island, and is easily separated from *B. convoluta* by its long capsule and lid.

217. **B. subulata,** (Linn.) Beauv.

On earth, Skull Creek, Crane Lake, Assa., June, 1894; on Bragg's Creek, Elbow River, Rocky Mountains, June, 1897; on earth on rock, Niagara River, Ont.; also on Pelee Point, Essex Co., Ont., 1901. (*Macoun.*) On earth in rather dry places at Dawson, Yukon, 1899. (*Williams.*)

218. **B. mucronifolia,** Bruch & Schimp.

Crevices of limestone rocks, Rockcliffe Park, Ottawa, Ont., May, 1900. (*Macoun.*)

220. **B. ruralis,** (Linn.) Hedw.

On sand along the sea-beach at Comox, Vancouver Island, May 2nd, 1887; in sand under trees, Pelee Point, Essex Co., May, 27th, 1901. (*Macoun.*) On rocks, Unalaska Island, Behring Sea, Sept., 1892. (*J. M. Macoun.*) On rocks about lakes Lindeman and Bennett, Yukon, 1899. (*Williams.*)

222. **B. aciphylla,** Bruch & Schimp.

All references to *B. aciphylla* in part VI. belong here, except that of Roger's Pass, which belongs to the next.

On earth by the Indian cemetery, Comox, Vancouver Island, June, 1893. (*Macoun.*)

999. **B. pseudo-aciphylla,** Kindb. in Hedwigia, 1896, 63.

Leaves long, sublinear-lingulate; obtuse; costa very rough above; hair-point red only at the base or in the upper half. Capsule narrower than in *B. norvegica;* peristome not seen.

On mountain slopes at discharge of Devil's Lake, Banff, Rocky Mountains, Alta., July 1st, 1891. (*Macoun.*)

223. **B. megalocarpa,** Kindb.

Our undoubted specimens of this species are:—

On rocks, Cypress Hills, Assa., Aug. 3rd, 1880; at Yale, B.C., July 17th, 1889; in Eagle Pass, near Revelstoke, B.C., May 13th, 1890; along Cadboro Bay and the Burnside Road, Victoria, Vancouver Island, 1887 and 1893. (*Macoun.*)

1000. **B. submegalocarpa,** Kindb. in Hedwigia, 1896, 64.

Differs from *B. ruralis:* Leaves longer, narrow and less reflexed above, from a broader base alternate or sublinear; outer

basal cells golden yellow; not porose; hair-point often red in the lower half. Peristome faintly contorted, shorter than the tube.

On damp rocks at Sicamous, B.C., July 4th, 1889. (*Macoun.*)

224. **B. lævipila,** Bruch & Schimp.

On trees, Vancouver Island. (*Rœll.*)

227. **B. papillinervis,** C. M. & Kindb.

On rocks at Clearwater Lake, Labrador, Aug., 1898. (*A. P. Low.*)

944. **B. læviuscula,** Kindb.

On rocks in the Crow's Nest Pass, Rocky Mountains, Alta., Aug. 20th, 1897; at the base of trees near Victoria, Vancouver Island, May 17th, 1893. (*Macoun.*)

941. **B. vinealis,** Braun.

On banks by the sea at Comox, Vancouver Island, June, 1893. (*Macoun.*)

1001. **B. subcuneifolia,** Kindb., Revue Bryol. 1896.

Leaves suboval-ovate, sometimes acute or apiculate, slightly reflexed below, larger than in the last and not crisped; costa not excurrent, finally red-brown. Capsule as in the last; peristomial tube more prominent. Monœcious.

On rocks, St. Matthew's Island, Behring Sea, Aug. 10th, 1891. (*J. M. Macoun.*)

1002. **B. Waghornei,** Kindb., Bryol. N. Am. & Eur., 264.

Leaves from a short ovate, half-sheathing base to a long acuminate, acute, entire point, slightly reflexed a little above the base, faintly curled when dry; costa red. Tufts brown-red radiculose. Habit of *Didymodon rubellus.*

Rather rare. Newfoundland. (*Waghorne.*)

BRYOBRITTONIA, R. S. Williams, gen. nov.

Closely related to *Tortula* and *Desmatodon*, from which it is distinguished by the mamillose leaves, the exposed surfaces of the very distinct cells being highly convex. From *Trichostomum* and *Timmiella* it is distinguished by the costa with only one

stereid band; the first of these also has the leaves smooth or papillose and the second has a leaf lamina of two layers of cells, mamillose on the upper surface only.

This genus is dedicated to Mrs. Elizabeth G. Britton, by whose aid so many American students of our mosses have been encouraged.

1003. **B. pellucida,** R. S. WILLIAMS.

With much the habit of *Tortula latifolia* but leaves much longer and narrower above. Stems mostly simple, radiculose below, in loose, rather dark green tufts up to 2 cm. high, in cross-section irregularly oval (about .320 mm. long) with walls of two or three rows of slightly thickened irregular cells, ground tissue of large thin-walled cells, surrounding a distinct central strand of numerous small thin-walled cells. Terminal leaves (often enclosing numerous long paraphyses-like hairs) oblong-lanceolate, up to 7.5 mm. long and 1.5 mm. broad, plicate and somewhat crispate when dry or rarely nearly straight, mamillose on both faces except dorsal side of costa, crenulate-serrate on flat borders in upper half, obtusely or somewhat acutely pointed, with stout costa (.140 mm. wide near base) long-decurrent on stems and vanishing several cells below apex. Lower leaves ovate-oblong (about 3 mm. long). Leaf cells above rhomboidal to hexagonal, about .016 mm. in diameter, becoming gradually elongated below and hyaline, the cells near margin a little above base .004—.006 mm. wide and up to .160 mm. long, toward costa .020—.025 mm. wide and up to .100 mm. or more long. Cross-sections of costa show in the ventral half about 4 guide-cells with a few accessory cells or even 1 or 2 rows of accessory cells nearly as large, in addition to the row of mamillose cells on ventral surface. The dorsal half of costa consists of a stereid band, the outer row of cells a little larger than the others with a distinct central strand of small, irregular, thin-walled cells.

Yukon River bluff, just below Dawson, Yukon, April 16th, 1899. (*Williams.*)

43. SCOULERIA, Hook.

In an article by Mrs. E. G. Britton in Vol. XXIV., pp. 36-43 of the Torrey Bulletin the reader will find the three species given on pages 61-62 of part VI. of my Catalogue of Canadian Plants

fully discussed. In the article before me she reduces the three species to one and retains *S. aquatica* var. *nigrescens*, the original of *S. Nevii*, as regards my specimens. I fully agree with Mrs. Britton in her decision as I could see no reason for separating the plants when fresh except by their color.

No specimens of this species have been collected since the publication of Part VI.

232. **S. aquatica,** HOOK.

Fine fruiting specimens collected near Cañon City. Dyea Creek, Alaska. As usual, in clear mountain streams, the plants are blackish and robust ; also collected sterile specimens in Miles's Cañon and in fruit on the Yukon at Dawson, 1899. (*Williams.*) On rocks in Chilliwack River, B.C. (*J. M. Macoun.*)

44. GRIMMIA, Ehrh.

235. **G. conferta,** FUNCK.

On boulders on Moose Mountain, Rocky Mountains, Alta., June, 1897 ; on rocks by the Petewawa River, Algonquin Park, July 24th, 1900. (*Macoun.*) Marsh Lake, Yukon, 1899. (*Williams.*)

236. **G. velutina,** KINDB. Revue Bryol. 1896.
G. manniæ, Cat. Can. Musci, 62.

Leaves broad-ovate, subobtuse, recurved all around and not carinate ; cells subquadrate pellucid; hair-point rarely present. Tufts brown and velvet-like when dry, low as in *G. manniæ*, but more compact. Capsules unknown.

On dry sun-baked rocks on the right bank of the Fraser River, beyond the bridge at Lytton, B.C., April 17th, 1889. (*Macoun.*)

237. **G. apocarpa,** HEDW.

On dry rocks, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898. (*Macoun.*) On rocks at Credit Forks, Ont., 1892. (*Jas. White.*) Growing in blackish tufts on perpendicular rock walls at Lake Lindeman, Yukon. (*Williams.*)

238. **G. gracilis,** SLEICHER.

On granite rocks, Credit Forks, Ont., 1892. (*Jas. White.*) On rocks in ravines at Margaree, Cape Breton Island, N.S., 1898 ; on

rocks, Cascades, Gatineau River, Que., June, 1900 ; on rocks in a ravine at Woodstock, New Brunswick, July, 1899; on rocks, Petewawa River, Algonquin Park, Ont., July, 1900. (*Macoun.*) On rocks, Lake Lindeman, Yukon, 1899. (*Williams.*) On rocks, Chilliwack Valley, B.C. (*J. M. Macoun.*)

239. **G. rivularis,** Nees & Hornsch.

On rocks near the water-line at Lake Lindeman, Yukon, 1899. (*Williams.*)

240. **G. alpicola,** Swartz.

On rocks along Peace River, below the mouth of Smoky River, Oct. 2nd, 1872. Referred in Part VI., p. 64, to *G. platyphylla.*

On wet rocks, Petewawa River, Algonquin Park, Ont., July, 1900. (*Macoun.*)

241. **G. platyphylla,** Mitten.

On rocks along Jumping Pound Creek, Rocky Mountains, Alta., June, 1897. (*Macoun.*)

246. **G. heterophylla,** Kindb.

G. chloroblasta, Kindb., No. 245 Cat. Can. Musci., 64.

On rocks in Roger's Pass, Selkirk Mountains, B.C., July 31st, 1890. (*Macoun.*)

1004. **G. pseudo-rivularis,** Kindb., Bryol. N. Am. & Eur., 234.

Differs from *G. gracilis.* Leaves larger and broader, narrowed to a short-subulate point, patent when dry ; cells less sinuous ; costa, sub-excurrent rough only in the upper part. Capsule oval ; teeth red ; calyptra mitriform. Stem long-decumbent. Tufts green.

On rocks, Sydenham Falls, Owen Sound, Ont., Sept. 11th, 1890 ; also on rocks at Ottawa and at Brighton, Northumberland Co., Ont., Oct., 1888 ; on rocks along the Colquitz, near Victoria, Vancouver Island, May 22nd, 1893. (*Macoun.*)

Subsp. **lancifolia,** Kindb., Bryol. N. Am. & Eur., 234.

Leaves narrower and less acute sometimes with an obsolete rough hairpoint ; costa not excurrent. Stem not long.

On rocks on Kadiak Island Alaska, Sept., 1891. (*J.M. Macoun.*)

On rocks at Meech's Lake, near Chelsea, Que., Sept., 30th, 1893; on rocks in the torrent at Hector, Rocky Mountains, B.C., Aug. 11th, 1890. (*Macoun.*)

1005. **G. pruinosa,** WILSON.
G. ambigua, Sulliv.; Lesq. & James, Mosses of N. Am., 135.

On rocks along Bragg's Creek, Elbow River, Rocky Mountains, July, 1897; not uncommon at Banff, Devil's Lake, Kananaskis Pass and Kicking Horse Lake, Rocky Mountains, 1890 and 1891. (*Macoun.*)

249. **G. anodon,** BRUCH & SCHIMP.

On sandstone rocks, Cypress Hills, Assa., June, 1894; also on sandstone rocks, Wood Mountain, Assa., June, 1895; on rocks, Jumping Pound Creek and Crow's Nest Pass, Rocky Mountains, Alta., July, 1897; on rocks at Lytton, B.C., April 16th, 1889. (*Macoun.*)

250. **G. plagiopodia,** HEDW.

On rocks in the Crow's Nest Pass, Rocky Mountains, Alta., July, 1897. (*Macoun.*)

Subsp. **Brandegei,** (AUSTIN) KINDB.,
G. playgiopodia, var. *pilifera*, Lesq. & James' Cat. Can. Musci., 65.

On sandstone rocks, Wood Mountain, Assa., June 10th, 1895. (*Macoun.*)

251. **G. nivalis.** KINDB.
G. tenerrima, Ren. & Card.; Kindb. Bryol. N. Am. & Eur., 221.

On rocks, summit of Mount Benson, near Nanaimo, Vancouver Island, July 10th, 1893. (*Macoun.*)

257. **G. prolifera,** C. M. & KINDB.

On rocks, Newfoundland. (*Waghorne.*) On rocks at Pass Creek, Columbia River, B.C., June 20th, 1890; on rocks, Albert Cañon, Selkirk, Rocky Mountains, B.C., July 29th, 1890. (*Macoun*) On rocks, Unalaska, Island, Behring Sea, June, 1897. (*J. M. Macoun.*)

258. **G. torquata,** HORNSCH.

On rocks in a ravine at Goldstream, Vancouver Island, June, 1893. (*Macoun.*) Sterile specimens were collected at Sheep Creek, Dyea Creek, Alaska; also at lakes Lindeman and Bennett, Yukon, 1899. (*Williams.*) On rocks, Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

259. **G. tortifolia,** KINDB., subsp. **pellucida,** KINDB. Bryol. N. Am. & Eur. 217.

Leaves larger and longer than the species, ovate-lanceolate, subacute, bright green; cells pale, pellucid, nearly all quadrate and not distinctly sinuous; costa pellucid. Capsules unknown. Tufts pale green when dry.

On rocks, Eagle Pass, Gold Range, B.C., May 23rd, 1890; also on Parson's Mountain, near Victoria, Vancouver Island, May 19th, 1893. (*Macoun.*)

263. **G. depilata,** KINDB.

On damp rocks at Esquimault and Parson's Mountain, near Victoria, Vancouver Island, 1893. (*Macoun.*)

1006. **G. Canadensis,** KINDB., Bryol. N. Am. & Eur. 226.

Leaves somewhat long, recurved below at both sides, flexuous when dry; middle cells rectangular, the upper subquadrate distinctly sinuous, the alar hyaline and very numerous. Capsule small and oval. Tufts of yellowish or brownish green 4—5 cm. high. Branches curved.

On rocks at Esquimault Harbour, near Victoria, Vancouver Island, May 13th, 1893. (*Macoun.*)

1007. **G. procera,** KINDB.

Leaves long, recurved nearly all around, nearly appressed when dry; cells yellow, the upper short and not or faintly sinuous, the alar few and the inner basal long; hair-point short and rough. sometimes wanting. Tufts brownish, stem 5—10 c.m. high, Habit of *G. patens.*

On rocks, Parson's Mountain, near Esquimault, Vancouver Island, May 12th, 1893. (*Macoun.*)

266. **G. microtricha,** C. M. & KINDB.

On dry rocks at Revelstoke, B.C., May 7th, 1890. (*Macoun.*)

270. **G. ovata,** WEB. & MOHR.

On rocks, Clearwater Lake, Labrador, July 21st, 1896. (*A. P. Low.*) On rocks, Jumping Pound Creek, and on Moose Mountain, Rocky Mountains, Alta, June, 1897. (*Macoun.*) Lake Lindeman and Dawson, and at various intermediate points on the Yukon. (*Williams.*)

272. **G. calyptrata,** HOOK.

Coscinodon calyptratus, Hook.; Kindb., Bryol. N. Am. & Eur. 241.

1008. **G. arctophyla,** KINDB., Revue Bryol. 1896.

Leaves ovate-oblong, involute above, suberect when moist, appressed when dry, the uppermost not larger; basal cells generally short, the upper short and opaque; hair-point not long. Capsule suboblong brownish; lid apiculate; annulus indistinct; pedicel straight. Tufts cohering, generally blackish when dry. About 3 cm. high.

On rocks, Greenland. (*Berggren.*) On rocks, Paugan Falls, Gatineau River, Que., Aug. 24th, 1894. (*Macoun.*)

Subsp. **labradorica,** KINDB., Bryol. N. Am. & Eur. 221.

Tufts about 1 cm. high, brown-green. Inner (lower) basal leaf-cells long. Lid of capsule obliquely rostellate.

On rocks, Clearwater Lake, Labrador, July 21st, 1896. (*A. P. Low.*)

273. **G. commutata,** HUEBEN.

On rocks along the Gatineau River, Que., June 22nd, 1900. (*Macoun.*)

1009. **G. teretinervis,** LIMPRICHT.

On boulders usually covered with water in the Petewawa River, Algonquin Park, Ont., July 24th, 1900. (*Macoun.*)

1010. **G. tenuicaulis,** R. S. WILLIAMS, Bull. Torr. Bot. Club, XXVII ; 316-317, 1900.

On rather dry rock walls at Dawson, Yukon, 1899. (*Williams.*)

1011. **G. ortholoma,** KINDB., Revue Bryol. 1896.

Leaves long, nearly appressed when dry; nearly all cells sinuous, middle one rectangular; hairpoint long and nearly smooth. Capsule very small; lid with a short conic or oblique beak. Tufts 1-2 cm. high. Leaves often with brown branched brood filaments.

1012. **G. Californica,** SULLIV.; Lesq. & James' mosses of N. America, 143.

Above the basin, Juneau, Alaska. (*Miss G. Cooley.*)

1013. **G. subflaccida,** KINDB., Ott. Nat., Vol. XIV., p. 85.

Agrees with the European *G. flaccida* (De Not.) Lindb., not found in America, in brittle orange peristome and channelled ovate-lanceolate, entire leaves with not distinctly sinuous cells; differs in the leaves being smaller, and recurved nearly all around, muticous or with a short and rough hair-point; also in the capsule being narrower. Lid and calyptra not seen.

On rocks at Edmondston, New Brunswick, Sept. 7th, 1899. (*Macoun.*)

1014. **G. compacta,** KINDB.

On sandstone rocks, Jumping Pound Creek, Rocky Mountains, Alta., June 12th, 1897. (*Macoun.*)

45. RACOMITRIUM, Brid.

279. **R. aciculare,** (LINN.) BRID.

On wet rocks, Nagai Island, Alaska, Sept. 18th, 1892; on rocks, Chilliwack River, B.C., 1901. (*J. M. Macoun.*) On wet rocks in a brook at Aspy Bay, Cape Breton Island, N.S., Aug. 1898; also in the bed of a brook at Goldstream, Vancouver Island, 1893. (*Macoun.*) Juneau, Alaska, and at Gold Creek Cañon, near Juneau. (*Miss G. Cooley.*) Lake Lindeman, Yukon, 1899. (*Williams.*)

280. **R. Nevii,** C. MUELL.

On rocks, Chilliwack River, B.C., 1901. (*J. M. Macoun.*)

282. **R. Macounii,** KINDB.

On rocks on mountains, Chilliwack River, 1901. (*J. M. Macoun.*)

284. **R. robustifolium,** KINDB.
Grimmia robustifolia, Kindb., Bryol. N. Am. & Eur., p. 225.

On damp rocks, Point Pleasant, Halifax, N.S., July 10th, 1899. (*Macoun.*)

285. **R. Sudeticum,** (HEDW.) BR. & SCH.
Grimmia microcarpa, (HEDW.) C. MUELL.

On rocks, Lake Lindeman, Yukon, 1899. (*Williams.*)

286. **R. heterostichum,** BRID.
Grimnia heterosticha, (Hedw.) C. Muell.

Lake Lindeman, Yukon ; Skagway, Alaska. (*Williams.*)

Subsp. **micropoides,** KINDB., Bryol. N. Am. & Eur. 239.

Leaves pellucid with a very short hair-point; upper cells sometimes rectangular ; alar cells hyaline. Capsule small, scarcely shorter than the pedicel.

On rocks, in Roger's Pass, Selkirk Mountains, B.C., July 30th, 1890; on rocks three miles below Hector, Rocky Mountains, B.C., Aug. 13th, 1890. (*Macoun.*)

288. **R. affine,** (SCHLEICH.) LINDB.

On rock, Unalaska Island, Behring Sea, August, 1891. (*J. M. Macoun.*)

289. **R. fasciculare,** (SCHRAD.) BRID.
Grimmia fascicularis, (Schrad.) C. Muell.

On rocks in ravines at Margaree, Smoky Mountain and Half Way Brook, Cape Breton Island, N.S., 1898. (*Macoun.*) Lake Lindeman, Yukon. (*Williams.*)

290. **R. varium,** MITTEN.
R. Oreganum, Ren. & Card., Cat. Can. Musci, 75.

All references in Pt. VI. to No. 291 belong here.
Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

293. **R. microcarpum,** (SCHRAD.) BRID.
Grimmia ramulosa, Lindb.

On rocks in a ravine at Margaree, Cape Breton Island, N.S., July, 1898. (*Macoun.*) On rocks, Seal Lake, Labrador, July, 1896. (*A. P. Low.*) Lake Lindeman, Yukon. (*Williams.*)

294. **R. hypnoides,** (Linn.) Willd.
R. lanuginosum, Brid.; Cat. Can. Musci, 76.
Grimmia hypnoides, (Linn.) Lindb.

On rocks, Nagai Island, Alaska, 1892. (*J. M. Macoun.*) Fort Chimo, Ungava Bay, and Whale River, Labrador, 1896; also Summit Lake, Manacuagan River, Que., 1895. (*A. P. Low.*) On earth on the "Bar" at South Ingonish and St. Ann's Harbour, Cape Breton Island, N.S., 1898. (*Macoun.*) On rocks, Baffin Land, north of Hudson Strait, July, 1897. (*Dr. R. Bell.*) Parry's Falls, Great Slave Lake, May 15th, 1900. (*J. W. Tyrrell.*) Lake Lindeman, Yukon. (*Williams.*)

295. **R. canescens,** (Weis.) Brid.
Grimmia canescens, (Timm.) C. Muell.

On stones and sand, Margaree, Cape Breton Island, N.S., 1898; on earth, Moose Mountain, Rocky Mountains, Alta., 1897. (*Macoun.*) On rocks, Fort Chimo, Ungava Bay, Labrador, 1896. (*A. P. Low.*) Near the snow line, above the basin, Juneau; also Davidson Glacier, Terminal Moraine, Pyramid Harbour, on the Sound near the shore, Alaska. (*Miss G. Cooley.*) Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*) Sheep Camp, Dyea Creek, Alaska, and Lake Lindeman, Yukon. (*Williams.*)

1015. **R. Panschii,** C. Muell.

On Sabine Island, Greenland. (*Pansch.*)

1016. **R. tenuinerve,** Kindb., Revue Bryol. 1896.

Leaves longer-subulate than in *R. fasciculare*, carinate, yellowish green; cells narrow; costa faint, vanishing far below the apex; hair-point none. Stem long, sometimes without short branchlets. Pedicel 0·5 c.m. long. Calyptra not seen.

On rocks along the Columbia River at Revelstoke, B.C. May 19th, 1890. (*Macoun.*) St. Paul Island, Behring Sea, July 3rd, 1892. (*J. M. Macoun.*)

1017. **R. Palmeri,** Kindb., Revue Bryol. 1896.
R. microcarpum, var. *Palmeri*, Kindb., Cat. Can. Musci, 268.

On rocks, mouth of Skeena River, B.C., May, 1892; on earth and rocks, St. Paul Island, Behring Sea, 1892. (*J. M. Macoun.*)

1018. **R. Jenseni,** KINDB., Revue Bryol. 1896.

Leaves small, broadly ovate-lanceolate, acute, blackish when dry ; the upper with a short hair-point ; upper cells short ; costa brown, percurrent and papillose. Capsules unknown.

On rocks and sand, East Greenland, Aug. 5th, 1885. (*P. Eberlin.*)

1019. **R. depressum,** LESQ.

On rocks, Mosquito Bay, Labrador, Lat. 61° 25′, Aug. 13th, 1898. (*A. P. Low.*)

46. HEDWIGIA, Ehrh.

297. **H. albicans,** (WEBER.) LINDB.
H. ciliata, Ehrh., Cat. Can. Musci, 76.

On rocks, Clearwater Lake, Labrador, July, 1896. (*A. P. Low.*) On rocks, Spanish Mills, Georgian Bay, and at Credit Forks, Ont. (*Jas. White.*) On dry boulders in woods, Margaree, Cape Breton Island, N.S., 1898 ; along Elbow River, Rocky Mountains, Alta., 1897 ; on rocks, Câche Lake, Algonquin Park, Ont., June, 1900 ; on rocks, Whirlpool Rapids, Niagara River, 1901. (*Macoun.*) Common about Dawson and Lake Bennett, Yukon. *Williams.*)

Var. **subnuda,** KINDB.

On rocks, near Wooler, Ont., 1888 ; on boulders at Owen Sound and along the Sydenham River, Ont., Sept., 1890 ; on rocks, Câche Lake, Algonquin Park, Ont., July, 1900. (*Macoun.*)

Var. **leucophæa,** SCHIMP.

Juneau, Alaska. (*Miss G. Cooley.*)

51. ZYGODON, Hook. & Tayl.

303. **Z. viridissimus,** (DICKS.) R. BR.

On oak trees, Victoria, Vancouver Island, May 17th, 1893. (*Macoun.*)

52. AMPHORIDIUM, Schimp.

304. **A. Lapponicum,** Schimp.

Zygodon lapponicus. Hedw.; Kindb., Bryol. N. Am. & Eur 316.

On wet rocks in a ravine at Margaree, Cape Breton Island, N.S., July, 1898; crevices of rocks, Cache Lake, Algonquin Park, June, 1900; in the Crow's Nest Pass, and at Lake Louise, Rocky Mountains, Alta., 1897; on damp rocks, Whirlpool Rapids, Niagara Falls, 1901. (*Macoun.*) On rocks, Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*) Lake Lindeman and Lake Marsh, Yukon. (*Williams.*)

Subsp. **decipiens,** Kindb., Bryol. N. Am. & Eur. 317.

Perichetial leaves longer acuminate than in *A. lapponicus;* costa long excurrent.

On rocks at Agassiz, B.C., May 15th, 1889; Mount Benson, near Nanaimo, Vancouver Island, June 8th, 1887; and at Goldstream, Vancouver Island, June 2nd, 1893. (*Macoun.*)

305. **A. Mougeotii,** Schimp.

Zygodon Mougeotii, Bryol. Eur.; Kindb., Bryol. N. Am. & Eur. 316.

On damp rocks in a ravine at Margaree, Cape Breton Island, N.S., July, 1898; on rocks in the Crow's Nest Pass, Rocky Mountains, Alta., Aug., 1897. (*Macoun.*)

1020. **A. crispatus,** Kindb., Revue Bryol. 1896.

Leaves crisped, entire, with a longer acicular point than *A. Mougeotii:* the perichetial leaves are broader, long-sheathing and abruptly narrowed to the subulate shorter point.

The following specimens referred in Part VI. to *A. Mougeotii* and *Californicus* belong here.

On damp rocks, Pass Creek, Sproat, Columbia River, B.C., June 20th, 1890; on rocks, Eagle Pass, Gold Range, near Revelstoke, B.C., May 9th, 1890; on rocks at Yale, B.C., May 17th, 1889; on rocks at Sicamous, B.C., July 7th, 1889. (*Macoun.*)

306. **A. Californicum,** Lesq. & James.

Zygodon californicus, Hampe; Kindb., Bryol. N. Am. & Eur., 316.

1021. **A. Sullivantii,** LESQ. & JAMES, Mosses of N. America.
Zygodon Sullivantii, C. Muell. ; Kindb., Bryol. N. Am. & Eur., 315.

On wet rocks Halfway Brook, Cape Breton Island, N.S., Aug. 4th, 1898. (*Macoun.*)

53. DRUMMONDIA, Hook.

1022. **D. Canadensis,** KINDB., Revue Bryol., 1896.
D. clavellata, Hook. var. *Canandensis*, Kindb., Cat. Can. Musci, 81.

Differs from *D. clavellata.* Leaves generally sub-obtuse, channelled, distinctly involute at the borders all around. Perichetial leaves broader, more obtuse ; nearly all cells lax and long-rectangular. Capsule globose a little larger ; lid short-rostrate. Tufts sometimes brown. Monœcious. Nearly allied to *D. obtusifolia.* C Muell, Chili.

54. ULOTA, Mohr.

309. **U. Drummondii,** BRID.
Weissia Drummondii, (Hook & Grev.) Lindb.

On trees and roots, Big Intervale, Margaree, and on rocks, Halfway Brook, Cape Breton Island, N.S., 1898. (*Macoun.*) On trees, Chilliwack Valley, B.C., may be a new species. (*J. M. Macoun.*) On bark of *Alnus* at Sheep Camp, Dyea Creek, Alaska. (*Williams.*)

310. **U. Ludwigii,** BRID.

On trees at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898. (*Macoun.*) On old fences at Edmonton, Ont., 1892. (*Jas. White.*) On trees in woods at Ottawa, Ont., on trunks, Algonquin Park, Ont., June, 1900. (*Macoun.*)

312. **U. Bruchii,** HORNSCH.
Weissia Bruchii (Hornsch.) Lindb.

On rocks at Sheep Camp, Dyea Creek, Alaska ; and Lake Lindeman, Yukon, 1899. (*Williams.*)

318. **U. crispa,** Brid.

Orthotrichum ulophyllum, Ehrh. ; Kindb., Bryol. N. Am. & Eur., 307.

Weissia ulophylla, (Ehrh.) Lindb.

On trees in woods at Margaree, Cape Breton Island, N.S., July, 1898 ; on spruce and fir trees at Ottawa, Ont. ; on trees at Sudbury Junction, Ont., 1884. (*Macoun.*) Sheep Creek, Juneau, Alaska. (*Miss G. Cooley.*)

319. **U. intermedia,** Schimp.

Orthotrichum ulophyllum intermedium, Schimp., Kindb., Bryol. N. Am. & Eur., 307.

On trees at Baddeck, Cape Breton Island, N.S., July, 1898. (*Macoun.*) On *Populus* and *Alnus* at Sheep Camp, Alaska, 1899. (*Williams.*)

320. **U. crispula,** Brid.

On beech trees at Edmonton, Ont., Sept., 1892. (*Jas. White.*) Sitka, Alaska. (*Miss G. Cooley.*) On trees in woods, Pelee Point, Essex Co., Ont., 1901. (*Macoun.*)

321. **U. phyllantha,** Brid.

Orthotrichum jutlandicum, Brid. ; Kindb., Bryol. N. Am. & Eur. 307.

Weissia phyllantha, (Brid.) Lindb.

On trees, South West Point, Anticosti, Que., Aug. 22nd, 1883 ; on trees at Gaspé Basin, Que,, July 8th, 1882. This species was found fruiting at Louisburg, Cape Breton Island, N.S., July 17th, 1883. (*Macoun.*) On rocks just above tidewater at Skagway, Alaska. (*Williams.*)

322. **U. maritima,** C. M. & Kindb.

On rocks by the sea near Esquimault, Vancouver Island, and on an old wharf at Comox, V.I., 1893 ; on boulders in the Margaree River, Big Intervale, Cape Breton Island, N.S., July 16th, 1898. (*Macoun.*) Middleton Island, Alaska, Lat. 59° 30′, Aug. 1892. (*J. M. Macoun.*)

324. **U. Barclayi,** MITT.

Nagai Island, Alaska, Sept. 1st, 1892. (*J. M. Macoun.*)

325. **U. connectens,** KINDB.

On beech trees at Edmonton, Ont., 1893. (*Jas. White.*) On trees at Port Dover, Lake Erie, Ont., Sept., 1890. (*Macoun.*) Specimens collected on rocks at Michipicotin, Lake Superior, on July 25th and 26th, 1869, were carefully examined by Mrs. E. G. Britton and doubtfully referred to *U. curvifolia.* It is probable that this species *(curvifolia)* will be found yet, in profusion along the northeast shore of Lake Huron.

My opinion coincides with Mrs. Britton that both *Ulota connectens* and *U. camptopoda* are young states of either *U. crispa* or *crispula.* I have looked for these species in summer, but have never found them except in the autumn. At this time the old capsule may be seen and great numbers of the young ones showing the very hairy calyptra.

55. ORTHOTRICHUM, Hedw.

326. **O. anomalum,** HEDW.

On limestone rocks along the Ottawa at Rockcliffe and Hull, Que.; on perpendicular rock, Foster's Flats, Niagara River, 1901. (*Macoun.*) On rocks, Skagway, Alaska, in fine fruit, June 29th, 1899; on rock at Dawson, Yukon. *(Williams.)*

327. **C. Blyttii,** SCHIMP.

O. Pylaisii, Brid ; Kindb., Bryol. N. Am. & Eur. 301.

On rocks near the sea, Newfoundland ; L'Anse-au-Clair, Labrador. (*Waghorne.*)

Subsp. **arcticum,** SCHIMP.

On rocks, Kadiak Island, Alaska, and St. Paul Island, Behring Sea, 1891. (*J. M. Macoun.*)

Subsp. **microblephare,** SCHIMP.; Kindb., Bryol. N. Am. & Eur. 302.

St. Paul Island, Behring Sea, 1891. (*Dr. Merriam.*)

It is more than probable that the present subspecies and the preceding are the same, but which is the correct one we are not prepared to say.

1023. **O. Kingii,** Lesq.; Lesq. & James, Mosses of N. America, 170.
O. Macounii, Aust., Bull. Torr. Bot. Club, Vol. VI, 343.

On rocks, Deer Park, Lower Arrow Lake, Columbia River. Referred to *O. lævigatum* in Part VI., p. 87; on rocks, Kicking Horse Pass, Rocky Mountains, B.C., Aug. 13th, 1890. (*Macoun.*) On rocks at Dawson, Yukon, 1899. (*Williams.*)

330. **O. cupulatum,** Hoffm.

On limestone rocks, Rockcliffe Park, Ottawa, Ont., 1891; on rocks, Moose Mountain, Elbow River, Rocky Mountains, Alta., 1897. (*Macoun.*)

1024. **O. Porteri,** Aust., Bull. Torr. Bot. Club, Vol. VI., 341.

On dry limestone rock, by the stairs leading down the cliff to Foster's Flats, Niagara Falls, Ont., May 16th, 1901. (*Macoun.*)

1025. **O. Lescurii,** Aust.
O. cupulatum, Hoffm. var. *minus*, Sulliv.; Cat. Can, Musci, 87.

On dry rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C., June 7th, 1890. (*Macoun.*)

1026. **O. Douglasii,** Duby.; Lesq. & James, Mosses of N. America, 167.

On rocks at Kicking Horse Lake, Rocky Mountains, July 29th, 1885; on rocks, mountain slopes at Spence's bridge, B.C., May 28th, 1889. (*Macoun.*) Referred to *O. cupulatum* in Part VI., p. 87.

336. **O. rupestre,** Schleich.

On rocks in a ravine at the Big Intervale, Margaree, Cape Breton Island, N.S., 1898; on rocks, Moose Mountain, Elbow River, Rocky Mountains, 1897. (*Macoun.*) Lake Lindeman, Yukon, 1899. (*Williams.*)

337. **O. affine,** Schrad.

On trees at Baddeck, Cape Breton Island, N.S., July, 1898. (*Macoun.*)

Subsp. **fastigiatum,** BRUCH.

Leaves shorter-acuminate and less papillose than in *O. affine.* capsule suboval ; calyptra nearly glabrous. Tufts usually pulvinate and about 1 cm. high. Habit of *O. pumilum.* On trees in woods, Big Intervale, Margaree, Cape Breton Island, N.S., July 16th, 1898. (*Macoun.*)

338. **O. alpestre,** HORNSCH.

On rocks, Moose Mountain, Elbow River, Rocky Mountains, Alta., alt. 6500, July 3rd, 1897. (*Macoun.*) On rock at Lake Marsh and Dawson, Yukon. (*Williams.*)

339. **O. speciosum,** NEES.

On trees and old rails at Brighton and Seymour, Northumberland Co., Ont., 1893. (*Macoun.*) On trees at Edmonton, Ont. (*Jas. White.*) On cottonwood at Skagway, Alaska, 1899. (*Williams.*)

343. **O. Ohioense,** SULLIV. & LESQ.

On poplar and birch trees at Edmonton, Ont. (*Jas. White.*) On old fence rails at Brighton, Northumberland Co., Ont., 1893 ; on trunks, Algonquin Park, Ont., June, 1900. (*Macoun.*)

344. **O. Schimperi,** HAMM.

On trees at Sandwich, Essex Co., Ont., May 24th, 1892 ; on trees in sandy woods, Pelee Point, Essex Co., May 27th, 1901 (*Macoun.*) On poplar trees at Brampton, Ont., June 23rd, 1892. (*Thos. Walker.*)

348. **O. consimile,** MITT.

On rocks near the sea, Victoria Arm, Victoria, Vancouver, Island, May 31st, 1893, (*Macoun.*)

Subsp. **anomaloides,** KINDB.

Capsule less exserted than in the species ; cilia shorter than the teeth. Stem taller.

On rocks in woods at Banff ; on damp rocks, Kananaskis Falls, and east end of Devil's Lake, all referred to *O. anomalum* in Part VI., p. 86.

350. **O. Rœllii,** VENTURI.

On rocks, Moose Mountain, Elbow River, Rocky Mountains, Alta., July, 1897. (*Macoun.*)

351. **O. psilothecium,** C. M. & KINDB.

On trees at Ottawa and on old fence rails at Carleton Place, Carleton Co., Ont. (*Macoun.*)

356. **O. pulchellum,** BRUNTON, subsp. **ulotæforme,** REN. & CARD.; Kindb., Bryol. N. Am. & Eur. 309.

Leaves distinctly crisped. Peristome pale.

On trees at New Westminster Junction, B.C., April 26th, 1889; also on Cedar Hill, near Victoria, Vancouver Island, May, 1887. Referred in Part VI., p. 91, to *O. pulchellum.*

1027. **O. Winteri,** SCHIMP.

On *Spiræa discolor* at Victoria, and on trees, Burnside Road and Parson's Mountain, near Esquimault, Vancouver Island, May, 1893. (*Macoun.*)

358. **O. obtusifolium,** SCHRAD.

On trees at Edmonton, Ont. (*Jas. White.*) On poplar trees, Big Intervale, Margaree, Cape Breton Island, N.S., 1898; on *Negundo aceroides* at Old Wives' Creek, Assa., 1895; on balsam poplar, Jumping Pound Creek, Rocky Mountains, Alta., 1897. *Macoun.*) On cottonwood at Skagway, Alaska, 1899. (*Williams.*)

359. **O. Jamesianum,** SULLIV.

On rocks, Crow's Nest Pass, Rocky Mountains, Alta,, Aug. 3rd, 1897. (*Macoun.*)

360. **O. papillosum,** HAMPE; KINDB., Bryol. N. Am. & Eur. 304.

All references in Part VI., p, 92 to *O. Lyellii* and varieties belong here.

Subsp. **strictum,** VENTURI.

Leaves dark green, shorter, appressed when dry.

On trees on Sea's Farm, near Victoria, Vancouver Island, May 8th, 1893. (*Macoun.*)

1028. **O. lyellioides,** KINDB., Revue Bryol. 1896.

Leaves long as in *O. papillosum*, nearly flat or undulate at the borders, faintly papillose, not appressed when dry; the upper crisped. Capsule narrow-cylindric, pale brown and nearly wholly exserted, pedicel somewhat long. Tufts dark green, blackish below, somewhat tall.

On trees at Comox, Vancouver Island, May 3rd, 1887. (*Macoun.*)

361. **O, Canadense,** BRUCH & SCHIMP.

The Ottawa specimens of this species were placed in Pt. VI. under *O. Schimperi*, but were changed to *O. Canadense* by Mrs. E. G. Britton when monographing the genus some years since.

1029. **O. Venturi,** KINDB.

On cedar rails at Brighton, Northumberland Co., Ont., Oct. 4th, 1893. (*Macoun.*)

1030. **O. subsordidum,** KINDB. (N. Sp.)

On rocks, Moose Mountain, Elbow River, Rocky Mountains, Alta., June 30th, 1897. (*Macoun.*)

1031. **O. gymnostomum,** BRUCH.

On trees, Newfoundland. (*Waghorne.*)

1032. **O. Bolanderi,** SULLIV.; Lesq. & James, Mosses of N. America, 168.

On rocks along Bragg's Creek, Rocky Mountains, Alta., July 9th, 1897. (*Macoun.*)

1033. **O. Watsoni,** JAMES; Lesq. & James, Mosses of N. America, 168.

On rocks, Moose Mountain, Elbow River, Rocky Mountains, Alta., July, 1897. (*Macoun.*)

NOTE.

Attention may be called here to two very valuable papers on the preceding genus written by Mrs. E. G. Britton. These papers were published in the Bulletin Torrey Botanical Club, Vol. XX., pp. 393-405, 1893, and Vol. XXI., pp. 1-15, 1894. They are im-

portant contributions to a difficult subject but a number of questions were left open that if now settled would add immensely to their value.

The same critical writer in Vol. XXII., pp. 452-458 of the Torrey Bulletin, discusses the genus *Leersia* (*Encalypta*) and more particularly the species, *E. Macounii*, Austin, and *E. ciliata*,, Hedw. Without entering into the controversy I may say that before Austin described *E. Macounii* I thought it was a young state of *E. ciliata*. After many years in 1887 I sent specimens collected at Wellington mine near Nanaimo to Dr. Kindberg, and these he named *E. Macounii*, and later, eastern specimens were sent him, all of which he pronounced *E. Macounii*. At the date of the publication of Part VI. of my Catalogue of Canadian Plants, in 1892, he decided that up to that time he had seen no true *E. ciliata* from America.

In the article cited Mrs. Britton takes the ground that our eastern *Encalypta* which Kindberg has referred to *E. Macounii* is identical with authentic specimens of *E. ciliata* received from Europe, cited and examined by Limpricht.

Dr. Kindberg in European and North American Bryineæ, published in 1897, seems to stand by what he wrote in 1892. In giving the range of *E. Macounii* and *E. ciliata* on page 297 of the work referred to he credits *E. Macounii* to both Europe and America, while *E. ciliata* is only cited from Europe and Greenland.

Without prejudice I may observe that from the standpoint of a layman we in America have been making two species out of one while our friends in Europe were making one species out of two.

56 ENCALYPTA, Schreb.

362. **E. commutata,** Nees & Hornsch.
E. alpina, Smith, 1805; Kindb., Bryol. N. Am. & Eur. 296.

On earth at the "Gap," Crow's Nest Pass, Rocky Mountains, Alta., Aug. 13th, 1897. (*Macoun.*)

364. **E. rhabdocarpa,** Schwæger.
Leersia rhabdocarpa, (Schwæg.) Lindb.

On earth along Bragg's Creek, Rocky Mountains, Alta., June 28th, 1897. (*Macoun.*) On earth at Dawson, Yukon, 1899. (*Williams.*)

365. **E. subspathulata,** C. M. & Kindb.

On earth along Farewell Creek, Cypress Hills, Assa., June 27th, 1895. (*Macoun.*)

370. **E. longipes,** MITTEN.

On earth, Moose Mountain, Elbow River, Rocky Mountains, June 30th, 1897. (*Macoun.*)

372. **E. Selwyni,** AUST.
Leersia Selwyni (Aust.), E. G. Britt.

Lake Marsh, and also common about Dawson, Yukon, 1899. (*Williams.*)

373. **E. streptocarpa,** HEDW.; Cat. Can. Musci, 96.
E. contorta (Wulfen.) Lindb.; Kindb., Bryol.N. Am. & Eur. 293.

Quite rare on rocks in a ravine at Margaree, Cape Breton Island, N.S., July 14th, 1898; on earth along the Bonnechere River, near Golden Lake, Ont., Sept., 1900. (*Macoun.*)

1034. **E. sub-brevicolla,** KINDB., N. Sp.

Leaves oblong-linguate, obtusate, undulate not recurved, entire, generally obtuse; hair-point whitish. Perichetial leaves sub-oblong, acuminate. Capsule brownish with a very short neck; teeth whitish when moist, palish red when dry; calyptra somewhat long with a hispid beak, fringed when young.

On rocks at Seal Lake, northern Labrador, Aug. 3rd, 1896. (*A. P. Low.*)

1035. **E. Labradorica,** KINDB. (N. sp.)

Leaves subovate, obtuse or subacute, entire, not recurved; hair-point whitish, or at the base yellowish. Capsule brownish with a distinct neck; teeth brown yellow; calyptra short, faintly rough, not fringed.

On rocks, Fort Chimo, Ungava Bay, Labrador, Aug. 30th, 1896. (*A. P. Low.*)

57. GEORGIA, Ehrh. TETRAPHIS, Hedw.

376. **G. pellucida,** (LINN.) RABENHOST.
Tetraphis pellucida, Hedw.; Cat. Can. Musci, 97.

On old logs, Big Intervale, Margaree, and on stumps Halfway Brook, Cape Breton Island, N.S., Aug. 1898; on old logs, Bragg's Creek, Elbow River, Rocky Mountains, Alta., June, 1897; on old stumps, Câche Lake, Algonquin Park, Ont., June, 1900. (*Macoun.*) Lake Lindeman, Yukon, 1899. (*Williams.*)

1036. **G. cuspidata,** KINDB., Revue Bryol. 1893.

Leaves subovate, short-acuminate, acute. Perichetial leaves cuspidate by the long excurrent costa. Capsule generally curved; pedicel straight.

On old logs at Leamington, Essex Co., Ont., Sept. 22nd, 1890. (*Macoun.*)

1037. **G. trachypoda,** KINDB., Revue Bryol. 1893.

Leaves subovate or ovate-oblong, short-acuminate and acute. Perichetial leaves with long, sublinear, acute acumen; costa not excurrent. Capsule straight; pedicel straight, rough in the upper part.

On an old stump at Sicamous, B.C., July 4th, 1889. (*Macoun.*)

377. **G. geniculata,** (GIRGENS.) LINDB.
Tetraphis geniculata, Girgens; Cat. Can. Musci, 97.

On old logs, Big Intervale, Margaree, Cape Breton Island, N.S., July 16th, 1898. (*Macoun.*) Salmon Creek near Juneau, Sitka. (*Miss G. Coo ey.*) Cañon City, Dyea Creek, Alaska, 1899. (*Williams.*)

59. SCHISTOSTEGA, Mohr.

378. **S. osmundacea,** WEB. & MOHR.

On the earth clinging to the roots of turned up stumps, Perley Lake, Algonquin Park, Ont., July 21st, 1900. (*Macoun.*)

60. DISSODON, Grev. & Arn.

379. **D. Frœlichii,** (HEDWIG.) G. & A.

On mount Forget-me-not, Elbow River, Rocky Mountains, alt. 7500 feet, Alta., July 14th, 1897. (*Macoun.*)

381. **D. splachnoides,** (THUNB.) GREV. & ARN.

A few specimens found growing on damp earth by the margin of a pond at Lake Lindeman, Yukon, 1899. (*Williams.*)

61. TAYLORIA, Hook.

383. **T. tenuis,** (DICKS.) SCHIMP

On cow's dung in woods near Baddeck, Cape Breton Island, N.S., July 8th, 1898.

384. **T. splachnoides,** HOOK.

On earth on mountains, Chilliwack River, B.C., 1901. (*J. M. Macoun.*)

62. TETRAPLODON, Bruch & Schimp.

386. **T. angustatus,** (L. FIL.) BR. & SCH.

On dung, Mount Forget-me-not, Elbow River, Rocky Mountains, Alta., alt. 6500 feet, July 14th, 1897. (*Macoun.*) Growing on bones in woods at Dawson, May 7th, 1899. (*Williams.*)

387. **T. bryoides,** (ZOEG.) LINDB.
T. mnioides (L. F.) Br. & Sch.

Unalaska Island and St. Paul Island, Behring Sea, June, 1892. (*J. M. Macoun.*) Fort Chimo, Ungava Bay, Labrador, Aug. 1896. (*A. P. Low.*) On dung, Jumping Pound Creek, Rocky Mountains, Alta., June, 1897. (*Macoun.*) North shore of Hudson Strait, Baffin Land, 1897. (*Dr. R. Bell.*) On earth, Chilliwack Valley, B.C.; these specimens are var. *Breweri.* (*J. M. Macoun.*)

389. **T. urceolatus,** (BRID.) BR. & SCH.

On bones near the summit of Moosehide Mountain, just back of Dawson, Yukon, 1899. (*Williams.*)

63. SPLACHNUM, Linn.

390. **S. Wormskioldii,** HORNEM.
Haplodon Wormskioldii, (Hornem.) Kindb., Bryol. N. Am. & Eur., p. 173.

St. George Island, Behring Sea, July 15th, 1892. (*J. M. Macoun.*) Seal Island, Labrador, 1900. (*E. B. Delabarre.*)

393. **S. ampullaceum,** LINN.

On earth and cow's dung in woods at Baddeck, Cape Breton Island, N.S., July 8th. 1898 ; on dung in a peat swamp, Catfish Lake, Algonquin Park, Ont., July, 1900. (*Macoun.*)

65. PHYSCOMITRIUM, Brid.

402. **P. turbinatum,** C. MUELL.

Very abundant on earth below Queenston Heights and within the spray of Niagara Falls, Ont., above the Power House, and on earth in the flower border close to the falls, May 16th, 1901. (*Macoun.*)

1038. **P. acuminatum,** (SCHLEICH.) BR. & SCH.

On earth in woods at Wyoming, Lambton Co., Ont., June 14th, 1901. In very fine fruit. (*Macoun.*)

Following the advice of Mrs. E. G. Britton, I gave more than usual attention to *Physcomitrium* last season and was enabled to add an additional species to our flora and widen the range of *P. turbinatum* very much.

66. FUNARIA, Schreb.

403. **F. calcarea,** WAHL.

On bare earth of the river bluff below Dawson, Yukon, 1899. (*Williams.*)

404. **F. hygrometrica,** SIBTH.

On earth at Baddeck, Cape Breton Island, N.S., July, 1898 ; in railway cuttings, Algonquin Park, Ont., 1900 ; abundant around Niagara Falls, 1901. (*Macoun.*) Lake Marsh and near Dawson, Yukon. (*Williams.*) On earth, Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

Var. **arctica,** BERGGREN.

Along the Lower Klondike River, Yukon. The specimens are mostly from 12 to 20 mm. high. (*Williams.*)

67. BARTRAMIA, Hedw.

406. **B. subulata,** Bruch & Schimp.
B. viridissima, Brid.; Kindb., Bryol. N. Am. & Eur. 323.

On rocks, Unalaska Island, Behring Sea, Aug., 1892. (*J. M. Macoun.*)

407. **B. ithyphylla,** Brid.

On rocks, St. Paul Island, Behring Sea, Aug., 1892. (*J. M. Macoun.*) On rocks, Moose Mountain, Elbow River, Alta., Aug., 1897. (*Macoun.*) At Seal Lake, northern Labrador, July, 1896. (*A. P. Low.*) By Lake Lindeman, Yukon, 1899. (*Williams.*)

408. **B. Œderi** (Gunner) Swartz.

Crevices of rocks, Credit Forks, Ont., Sept., 1893. (*Jas. White.*) On rocks, Crow's Nest Pass, Rocky Mountains, Alta., Aug., 1897; on rocks in a ravine, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898. (*Macoun.*) At Dawson, Yukon, 1899. (*Williams.*)

409. **B. pomiformis,** Hedw.

Shady moist bank in woods, Edmonton, Ont., 1892. (*Jas. White.*) Damp rocks, west of Hull, Que.; Câche Lake, Algonquin Park, 1900; on earth, Queenston Heights, Ont., May, 1901; Goldstream, near Victoria, Vancouver Island, 1893. (*Macoun.*) Juneau, alt. 3,000 feet; also at Salmon Creek and Gold Creek Cañon, near Juneau, Alaska. (*Miss G. Cooley.*) Cañon City and Sheep Creek, Dyea Creek, Alaska, 1899. (*Williams.*) On rock, Chilliwack River, B.C., 1901. (*J. M. Macoun.*)

1039. **B. crispa,** Swartz.
B. pomiformis, var. *crispa*, Schimp.; Lesq. & James, Mosses of N. America, 206.

On rocks, Placentia Bay, Newfoundland, July 25th, 1891. (*Waghorne.*) On earth in a ravine, Grand Narrows, and at Big Intervale, Margaree, Cape Breton Island, N.S., July 27th, 1898.

410. **B. glauco-viridis,** C. M. & Kindb.

On rocks at Meech's Lake, near Chelsea, Que., Sept., 1893; on rocks on Sea's farm, near Victoria Vancouver Island, May, 1893 (*Macoun.*)

1040. **B. breviseta,** LINDB., subsp. **rigidula,** KINDB.

On rocks, Greenland. (*Lange.*)

68. CONOSTOMUM, Swartz.

414. **C. boreale,** SWARTZ.

On rocks, Seal Lake, northern Labrador, Aug., 1896. (*A. P. Low.*) Growing in dense cushions on wet rock, near Long Lake, between Chilcoot Pass and Lake Lindeman, Yukon. (*Williams.*)

69. PHILONOTIS, Brid.

415. **P. marchica** (WILLD.) BRID.

In Part VI., on page 106, *P. Macounii* was placed as a synonym under this species. Later investigations have shown that the western specimens are really distinct from the eastern and are as they were first placed under *P. Macounii.*

In a railway ditch above Leamington, Ont., 1901. (*Macoun.*)

416. **P. fontana,** BRID.

On Smoky Mountain and at Margaree, Cape Breton Island, N.S., 1898; springs by Dow's swamp, Ottawa, Ont., and in the beaver meadow, Hull, Que., 1900; in damp woods by Drummond's Island, Niagara Falls, Ont., May, 1900. (*Macoun.*) St. Paul Island, Behring Sea. (*Dr. Merriam.*) Near the snow line, above the Basin, Juneau, Alaska. (*Miss G. Cooley.*) Rather common about Lake Lindeman and Lake Bennett, Yukon, 1899. (*Williams.*)

Subsp. **seriata,** MITTEN.

On earth, Gold Creek Cañon, near Juneau, Alaska. (*Miss G. Cooley.*)

1041. **P. Macounii,** LESQ. & JAMES, Mosses of N. America, 208.

Wet places near Victoria, Vancouver Island, May 9th, 1875 type station); wet rocks, Nanaimo, V.I., June 6th, 1887; on wet earth, Hastings, B.C., April 13th, 1889; wet earth at Revelstoke, B.C., May 9th, 1890. (*Macoun.*) Juneau, alt. 3,000 feet; also a doubtful specimen from Gold Creek Cañon, near Juneau, Alaska. (*Miss G. Cooley.*)

1042. **P. Muhlenbergii,** BRID.; LESQ. & JAMES., Mosses of N. America, 208.

On earth by a brook at Woodstock, N.B., July 4th, 1899. (*Macoun.*)

1043. **P. Arnellii,** HUSNOT.

On wet rocks, Greenland. (*Wenck.*)

1044. **P. Vancouverensis,** KINDB., Bryol. N. Am. & Eur. 326.

Leaves long-subulate; perigonial, patent, erect, broadly ovate-lanceolate, acute, nearly nerveless.

On wet earth at Yale, B.C., May 17th, 1889; on wet rocks along the Nanaimo River, April 26th, 1887. (*Macoun.*) Nagai Island, Alaska, Sept. 18th, 1892. (*J. M. Macoun.*)

1045. **P. cæspitosa,** WILSON.

In swamps, Greenland. (*Lange.*)

1046. **P. alpicola,** JURATZKA.

On wet ground, Greenland. (*Vanhœffen.*) In Newfoundland. (*Waghorne.*)

1047. **P. acutiflora,** KINDB., Hedwigia, 1896, p. 77.

Leaves not serrate and not falcate, recurved to or above the middle, with double mamillæ, generally appressed when dry, smaller than in *P. calcarea.* Perigonial leaves horizontally spreading. Tufts no high; fruiting stem very low.

On damp earth, Roger's Pass, Selkirk Mountains, B.C., July 30th, 1890; in damp meadows, Pier's farm, Victoria, Vancouver Island, May 8th, 1893. (*Macoun.*) On damp earth, Chilliwack River, B.C., 1901. (*J. M. Macoun.*)

1048. **P. adpressa,** FERGUSSON.

Wet places, Greenland. (*Vanhœffen.*)

1049. **P. radicalis,** BEAUVOIS.

Bartramia radicalis, Beauv.; Lesq. & James, Mosses of N. America, 206.

On rocks in a ravine at Goldstream, and on the shore of Shawnagin Lake, near Victoria, Vancouver Island, 1893. (*Macoun.*)

1050. **P. pumila,** KINDB., Bryol. N. Am. & Eur., 328.

Leaves erect, smaller and narrower than in *P. rigida*; costa scarcely excurrent. Tufts about 1 cm. high.

In ditches near the paper mill, Belleville, Hastings Co., Ont. (*Macoun.*)

70. CATOSCOPIUM, Brid.

418. **C. nigritum,** (HEDW.) BRID.

In fine fruit about springs at Dawson, Yukon, May 7th, 1899 (*Williams.*)

MEESIA, Hedw.

420. **M. uliginosa,** HEDW.

M. trichodes, (LINN.) Spruce; Kindb., Bryol. N. Am. & Eur., 318.

On boggy ground, Jumping Pound Creek, Rocky Mountains, June 14th, 1897. (*Macoun.*) At Dawson, Yukon. (*Williams.*)

422. **M. Albertinii,** BRUCH & SCHIMP.

In bogs, Newfoundland. (*Waghorne.*)

423. **M. tristicha,** BRUCH & SCHIMP.

M. triquetra, (LINN.) Aongst.; Kindb., Bryol. N. Am. & Eur., 318.

In bogs along Bragg's Creek, Elbow River, Alta., July 9th, 1897. (*Macoun.*) In fine fruit in Klondike River bottom, Yukon, July 23rd, 1899. *Williams.*)

73. PALUDELLA, Ehrh.

424. **P. squarrosa,** (LINN.) BRID.

In a bog north of the Saskatchewan at Prince Albert, Sask., July, 1896. (*Macoun.*) In bogs, Port Etches, Alaska, Lat. 60° 30′, June 18th, 1892. (*J. M. Macoun.*) Sterile specimens growing in bogs at Lake Lindeman; found abundantly in fruit at Dawson, July 23rd, 1899, growing in large patches many feet across. (*Williams.*)

75. LEPTOBRYUM, Schimp.

427. **L. pyriforme,** SCHIMP.

Moist ground, Edmonton, Ont., 1892. (*Jas. White.*) Fort Chimo, Ungava Bay, Labrador, 1896. (*A. P. Low.*) On Mount Forget-me-not, Elbow River, Rocky Mountains, Alta., 1897; railway cutting at Goldstream, near Victoria, Vancouver Island, 1893; in woods, Cape Breton Island, N.S., 1898; Algonquin Park and Golden Lake, Ont., 1900; along a railway ditch above Leamington, Essex Co., Ont., 1901. (*Macoun.*) Lake Lindeman and Dawson, Yukon, 1899. (*Macoun.*)

76. WEBERA, Hedw.

1051. **W. subpolymorphum,** KINDB., Bryol. N. Am. & Eur. 390.

Capsule oblong, pendant, and smaller than in *W. polymorphum;* neck shorter; lid rostellate. Leaves less crowded and not appressed when dry, sometimes subdecurrent; cells wider, stem uniformly foliate, not marked below. Dioecious.

On earth, mountains north of Griffin Lake, Gold Range, B.C.; alt. 7,500 feet, Aug. 10th, 1889. (*Macoun.*)

433. **W. nutans,** HEDW.

Bryum nutans, Schreb.; Kindb., Bryol. N. Am. & Eur. 384.
Pohlia nutans, (Schreb.) Lindb.

A very common moss on old logs, at the base of stumps and on earth in all parts of Ontario. (*Macoun.*) Salmon Creek near Juneau, and Loring; also at Nanaimo, Vancouver Island. (*Miss G. Cooley.*) Sheep Camp, Dyea Creek, Alaska; also on an island in the Yukon just below Fort Selkirk. (*Williams.*)

Var. **Macounii,** KINDB., Bryol. N. Am. & Eur. 385.

All leaves, also those on sterile stems and shoots, distinctly serrate, not glossy, finally red, densely crowded, appressed when dry.

In a wet railway cutting at Goldstream, Vancouver Island, June 2nd, 1893. (*Macoun.*)

Mr. Williams obtained a variety, his No. 643, at Lake Lindeman which has not yet been named.

434. **W. sphagnicola,** Schimp.
Pohlia sphagnicola, (Brid.) Lindb. & Arn.

Growing with slender, mostly solitary stems up through tufts of *Sphagnum* and *Aulacomnium.* In fine fruit at Dawson, Yukon, July 2nd, 1899. (*Williams.*)

1052. **W. gracilis,** De Not.
Pohlia gracili , Lindb.

On a shaded, moist sand ank of the Klondike River just above Dawson, Yukon, 1899. (*Williams.*)

1053. **W. proligera,** (Lindb.)
Pohlia proligera, Lindb.

In a marshy place at Lake Lindeman, Yukon, 1899 (*Williams.*)

1054. **W. cucullatiforme,** Kindb., Bryol. N. Am. & Eur. 387.

Differs from *W. cucullata ;* leaves subdecurrent smaller, appressed when dry, upper generally acute. Capsule smaller and more constricted ; cilia appendiculate.

On rocks, St. Paul Island, Behring Sea, August 1st, 1892. (*J. M. Macoun.*)

436. **W. canaliculata,** C. M. & Kindb.
Bryum nutans subsp. *canaliculatum,* C. M. & Kindb. ; Kindb., Byrol. N. Am. & Eur. 385.

On rocks Unalaska Island, Behring Sea, June 15th, 1892 ; on rocks Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

438. **W. pycno-decurrens,** C. M. & Kindb.
Bryum microsporum, Kindb., Bryol. N. Am. & Eur. 388.

On earth on the mountains along the Chilliwack River, B. C., 1901. (*J. M. Macoun.*)

439. **W. microcaulon,** C. M. & Kindb.
Bryum polymorphum, Hoppe & Hornsch, subsp. *brachycarpum.* Hoppe & Hornsch ; Kindb., Bryol. N. Am. & Eur., 390.

St. George Island, Behring Sea, 1892. (*J. M. Macoun.*)

444. **W. Lescuriana,** Lesq. & James.
Bryum Lescurii, Sulliv. ; Kindb., Bryol. N. Am. & Eur. 386.

On earth at Woodstock, N.B., July 4th, 1899. (*Macoun.*)

445. **W. carnea,** Schimp.
Bryum carneum, Linn.; Kindb., Bryol. N. Am. & Eur. 385.

In a railway cutting at Goldstream, near Victoria, Vancouver Island, June 2nd, 1893. (*Macoun.*)

446. **W. cruda,** Schimp.
Bryum crudum, (Linn.) Hudson ; Kindb., Bryol. N. Am. & Eur. 383.

Crevices of rocks, Parry Sound, and at Edmonton, Ont., 1893. (*Jas. White.*) On rocks, Nagai Island, Alaska, 1892, and St. Paul Island, Behring Sea, 1892 ; crevices of rocks, Chilliwack River, B.C., 1901. (*J. M. Macoun.*) On rocks, Baffin Land, north of Hudson Strait, 1897. (*Dr. R. Bell.*) On rocks, Fort Chimo, Ungava Bay, Labrador, 1897. (*A. P. Low.*) On rocks, Big Intervale, Margaree, Cape Breton Island, N.S., 1898 ; along Bragg's Creek, Rocky Mountains, Alta., 1897; on rocks, Cascades, Gatineau River, Que., 1900 ; crevices of rocks, Câche Lake, Algonquin Park, Ont., 1900. (*Macoun.*) Gold Creek Cañon, Juneau, Alaska. (*Miss G. Cooley.*) Lake Lindeman, Yukon, 1899. (*Williams.*)

447. **W. Schimperi,** (C. Muell.) Schimp.
Bryum Schimperi, C. Muell.; Kindb., Bryol. N. Am. & Eur. 385.

On rocks, Seal Lake, Labrador, August 3rd, 1896. (*A. P. Low.*)

450. **W. commutata,** Schimp.
Pohlia commutata, Lindb.

On rocks, Greenland. (*Berggren.*) Gold Creek Cañon, Juneau, Alaska. (*Miss G. Cooley.*) On a sandy bank of a stream, Lake Lindeman, Yukon, 1899. (*Williams.*)

Subsp. **gracile,** Schleich.; Kindb., Bryol. N. Am. & Eur. 388.

Crevices of rocks, Mount Queest, Gold Range, B.C., July, 1889. (*J. M. Macoun.*) Referred to *W. subcucullata*, in part VI., p. 113.

1055. **W. pseudo-carneum,** KINDB., Ott. Nat. Vol. XIV. p. 88.

Differs from *W. carneum* in the leaves being shorter, ovate-oblong, and long-decurrent; costa percurrent. Capsules not seen. On damp sand, Sable Island, N.S., August 16th, 1899. (*Macoun.*)

452. **W. albicans,** SCHIMP.

Bryum albicans, Wahlenb rg ; Kindb., Bryol. N. Am. & Eur. 389.

St. Paul Island, Behring Sea, Aug. 18th, 1892. (*J. M. Macoun.*) Damp rocks, Fort Chimo, Ungava Bay, Labrador, 1896. (*A. P. Low.*) Damp banks, Cadboro Bay, and wet rocks, Goldstream, Vancouver Island, 1893 ; wet rocks, Crow's Nest Pass, Rocky Mountains, Alta., 1897 ; in a railway ditch above Leamington, Essex Co., Ont., 1901. (*Macoun.*)

1056. **W. nitescens,** KINDB., Botan. Notiser, 1896.

Leaves oblong-lanceolate, acuminate ; perichetial leaves long. Capsule not constricted ; cilia long. Perigonial leaves erect. Tufts dense tomentose, silky or golden glossy. Dioecious with gemmiform male flowers; rarely synœcious.

On earth, Greenland. (*Vanhœffen.*)

77. BRYUM, Dill.

454. **B. arcticum,** BRUCH & SCHIMP.

St. Paul Island, Behring Sea, 1891, Alaska. (*Dr. Merriam.*) On earth in rather dry places at Dawson, Yukon, 1899. (*Williams.*)

457. **B. purpurascens,** BRUCH & SCHIMP, subsp. **autumnale,** LIMPRICHT.

Newfoundland. (*Waghorne.*)

460. **B. pendulum,** (HORNSCH.) SCHIMP.

At Dawson in fine fruit, July 30th, 1899 ; other specimens were collected on earth on ledges of rock at Dawson which were for a time doubtfully referred to *B. Brownii*, Br. & Sch. (*Williams.*)

1057. **B. Dawsonense,** R. S. WILLIAMS. Bull. of New York Bot. Gar., Vol. II., p. 124.

This plant is undoubtedly close to *B. pendulum*, differing in the short-pointed leaves, more distinctly bordered and in the long cilia, some of which are finely appendiculate.

In good fruit on damp earth at Dawson, August 28th, 1898. (*Williams.*)

1058. **B. longisetum,** BLAND.

On swampy ground with *Meesia uliginosa,* and in good fruit, July 31st, 1898. (*Williams.*)

1059. **B. conditum,** R. S. WILLIAMS, Bull. of New York Bot. Gar., Vol. II., p. 125.

On a rocky hillside between Cañon City and Sheep Camp on Dyea Creek, March 28th, 1898. This p ant comes nearest *uliginosum,* I believe, but differs in the more pointed leaf, with more distinct and revolute border, pitted leaf cells, blunt lid, more developed inner peristome and dioecious inflorescense. (*Williams.*)

1060. **B. cuspidatum,** SCHIMP.

Collected at Dawson, Yukon. This species has the costa excurrent into a sharp, denticulate point, 4 or 5 cells in length. (*Williams.*)

1061. B. **compactum,** HORNSCHUCH.

On rocks, Greenland. (*Vanhœffen.*)

1062. **B. Rœllii,** PHILIBERT.

Along Farewell Creek, Cypress Hills, Assa., June 27th, 1895. (*Macoun.*)

1063. **B. Alaskanum,** KINDB.

Leaves broad-ovate, apiculate or very short-acuminate, reflexed all around ; cells wide, the upper sub-rhombic ; costa short-excurrent. Capsule short but not thick, subclavate-piriform ; lid convex, mamillate ; pedicel not long. Fruiting stem tomentose with shorter and longer shoots. Uppermost leaves of stem and shorter shoots glomerate ; those of longer shoots not glomerate.

Alaska. (*J. M. Macoun.*) Locality unknown.

463. **B. inclinatum,** BRUCH & SCHIMP.

On sandy earth, Sable Island, N.S., Aug. 3rd, 1899. (*Macoun.*)

464. **B. Froudei,** KINDB.

On earth along Farewell Creek, Cypress Hills, Assa., June 26th, 1894. (*Macoun.*)

1064. **B. micans,** LIMPRICHT.

On earth or rocks, Greenland. (*Berggren.*)

1065. **B. lapponicum,** KAURIN., subsp. **subinclinatum,** KINDB.

Spores smaller than in the species, about 0·02 mm. Endostome adhering to the teeth; lid apiculate. Tufts very dense and tomentose.

On earth near Seal Lake, northern Labrador, July, 1896. (*A. P. Low.*)

477. **B. bimum,** SCHREBER.

Along Jumping Pound Creek, Rocky Mountains, Alta., 1897; on earth in a ravine, Woodstock, N.B., July, 1899; in boggy places west of Hull, Que., June, 1899; on Drummond Island, Niagara Falls, Ont., 1901. (*Macoun.*)

Var. **atrotheca,** REN. & CARD., Bot. Gaz., Vol. XIX., p. 238 (1894.)

Capsule, black-red; leaves scarcely denticulate or quite entire at the point.

Newfoundland, 1892. (*Waghorne.*)

479. **B. leucolomatum,** C. M. & KINDB.

Marshy spot, Otter Slide Brook, Algonquin Park, Ont., July 18th, 1900. (*Macoun.*)

480. **B. pallescens,** SCHLEICH.

On earth in a ravine, Grand Narrows, on dead wood and earth, Margaree, and on earth and rocks, Half-Way Brook, Cape Breton Island, N.S., 1898; on earth at Câche Lake, Algonquin Park, Ont., June, 1900; by the Saskatchewan at Prince Albert, Sask., June, 1896; on wet ground, Bragg's Creek, Elbow River, Rocky

Mountains, Alta., 1897. (*Macoun.*) On earth, Chilliwack Valley, B. C., 1901. (*J. M. Macoun.*)

483. **B. Knowltoni,** BARNES.

On damp and brackish sandy earth along the Lagoon, Sable Island, N.S. Not uncommon, Aug., 1899. (*Macoun.*)

488. **B. Raui,** AUSTIN.

On wet rocks, Sea's Farm, near Victoria, Vancouver Island, 1893. (*Macoun.*)

489. **B. Muehlenbeckii,** BRYOL. EUR.

On the summit of Hermit Mountain, Roger's Pass, Selkirk Mountains, B.C., Aug. 5th, 1890. (*Macoun.*)

494. **B. capitellatum,** C. M. & KINDB.

B. Oreganum, Sulliv.; Lesq. & James Mosses of N. Am. 230.

Mrs. E. G. Britton and Mr. R. S. Williams have compared the types of those two species and are satisfied that they are the same.

497. **B. cæspiticium,** LINN.

Along the railway bank, above Leamington, Essex Co., May 25th, 1901. (*Macoun.*) In good fruit at Dawson, Yukon, June 10th, 1898. (*Williams.*)

498. **B. synoico-cæspiticium,** C. M. & KINDB.

On earth by Niagara River, above the Suspension Bridge, Ont., May 18th, 1901. (*Macoun.*)

504. **B. capillare,** LINN.

Quite common on the bases of trees in woods, Niagara Falls, May, 1901 ; also on earth in woods, Camlachie, Lambton Co., Ont., May 20th, 1901. (*Macoun.*)

Subsp. **ruraliforme,** Kindb., Bryol. N. Am. & Eur. 358.

Leaves brown-red, strongly dentate, subacute ; limb brown. Shoot-leaves sometimes decurrent. Capsules unknown. Habit of *Barbula ruralis*. On damp rocks, Pier's Farm, Burnside Road, Victoria, Vancouver Island, May 11th, 1893. (*Macoun.*)

Subsp. **erythroloma,** Kindb., Bryol. N. Am. & Eur. 358.

Leaves purplish red, acute, nearly entire, limb rose-red.

On rocks by the sea, at Esquimalt, near Victoria, Vancouver Island, May 13th, 1893. (*Macoun.*)

1066. **B. speirophyllum,** Kindb., Bull. Soc. Bot. Ital., 1895.

Differs from *B. capillare ;* leaves narrowly limbate, distant, decurrent, generally entire, flaccid when moist, corrugate, not twisted, when dry.

On rocks, Mount Erskine, Salt Spring Island, Gulf of Georgia, B.C., May 9th, 1887 ; on Cedar Hill, near Victoria, Vancouver Island, April 18th, 1887 ; the var. *longipile* on damp rocks, Sea's Farm, near Victoria, May 8th, 1893. (*Macoun.*)

1067. **B. Donii,** Greville.

On rocks on Pier's Farm and on Sea's Farm, Burnside Road, near Victoria, Vancouver Island, May 11th, 1893 ; on rocks in a ravine at Goldstream, near Victoria, Vancouver Island, June 2nd, 1893 ; on earth at Comox, Vancouver Island, June 19th, 1893. (*Macoun.*)

Subsp. **obconicum,** Hornsch.; Kindb., Bryol. N. Am. & Eur. 359.

On rocks, Salt Spring Island, Gulf of Georgia, B.C., and at Nanaimo, Vancouver Island. (*Macoun.*)

509. **B. pallens,** Swartz.

On earth in a ravine, Grand Narrows, Cape Breton Island, N. S., July 27th, 1898. (*Macoun.*) Douglas Island, Lynn Canal, Alaska. (*Miss G. Cooley.*)

510. **B. Duvalii,** Voit.

On wet earth, Seal Lake, northern Labrador, Aug. 2nd, 1896. (*A. P. Low.*) Unalaska Island, Behring Sea, June 4th, 1897. (*J. M. Macoun.*) Sterile specimens collected at the head of Lake Bennett, Yukon. (*Williams.*)

511. **B. pseudotriquetum,** Schwaegr.

B. ventricosum, Dickson; Kindb., Bryol. N. Am. & Eur. 363.

On wet rocks and earth, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898 ; by a spring, Jumping Pound Creek, Rocky Mountains, Alta., June, 1897; on the shore of Shawnagin

Lake, near Victoria, Vancouver Island, June 2nd, 1893. (*Macoun.*) On wet rock at Skagway, Alaska; in fine fruit, August 27th, 1899. *Williams.*)

Var. **hyalodontium,** C. M. & KINDB.

On earth by a spring, Jumping Pound Creek, Rocky Mountains, Alta., June 15th, 1897. (*Macoun.*)

Var. **compactum,** B. & S.

At Dawson, Yukon, July 17th, 1899, in fine fruit. *Williams.*)

1068. **B. submuticum,** PHILIBERT ; Bull. of New York Bot. Gar. Vol. II., p. 127.

This species is quite near the preceding variety but still smaller and more slender. The leaves are broader, shorter pointed, more entire, and costa vanishing, more frequently, just below the point.

Collected in good fruit, July 17th, 1899, at Dawson ; also at the mouth of Little Salmon River. The plants form extensive mats, often many feet across, in low wet places. (*Williams.*)

1069. **B. suborbiculare,** PHILIBERT ; Bull. of New York Bot. Gar. Vol. II., p. 128.

This small moss is peculiar in having the broad obtuse leaves, clustered in three or four rosettes along the stem. It does not seem to be related very closely to any other American species.

At Dawson, Yukon, growing in a swamp with *Cinclidium* and apparently rare. Collected in good fruit, July 2nd, 1899. (*Williams.*)

517. **B. torquescens,** BR. & SCH.

On earth under trees, Pelee Point, Essex Co., Ont., May 27th, 1901. (*Macoun.*)

1070. **B. Revelstokense,** KINDB., Revue Bryol. 1896.

Leaves ovate-lanceolate, long-acuminate, entire with a pale not broad limb, much twisted when dry, short-decurrent, except the uppermost glomerate. Pedicel very long. Tufts green-tomentose 1–2 cm. high. Dioecious.

On rocks at Revelstoke, B.C., May 9th, 1890; barren specimens referred here were collected at Crow's Nest Lake, Rocky Mountains, Aug. 3rd, 1897. (*Macoun.*)

1071. **B. grandirete,** KINDB., Bryol. N. Am. & Eur. 353.

Leaves acute, not limbate, imbricate when dry, ovate or broad-ovate, not or scarcely acuminate, loosely disposed and short-decurrent ; cells very large ; upper sub-rhombic ; costa percurrent. Capsules unknown. Tufts sparingly radiculose, red-brown below, yellowish green above, not tall.

On earth, Roger's Pass, Selkirk Mountains, B.C., Aug. 7th, 1890. (*Macoun.*) Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

1072. **B. aciculinum,** KINDB., Bryol. N. Am. & Eur. 355.

Leaves oblong-lanceolate, acute, recurved nearly all around, nearly appressed when dry; upper cells oblong-rhomboidal, lower basal near the costa deep-red, numerous. Capsule brown ; teeth pale.

On Sproat Mountain, Columbia River, B.C., alt. 4,500 feet, June 24th, 1890. (*Macoun.*)

1073. **B. flagellosum,** KINDB., Bryol. N. Am. & Eur. 356.

Leaves generally ovate ; cells sub-rhombic ; costa sometimes short-excurrent. Uppermost leaves and those of flagelliform shoots ovate-oblong. Capsule brown, oblong pyriform, faintly constricted, smaller and shorter than in *B. Raui;* neck short. Tufts dense-tomentose. Habit of *B. cæstiticium.*

On earth at Hector, Rocky Mountains, B.C., Aug. 12th, 1890. (*Macoun.*)

1074 **B. Oreganum,** SULLIV.; Lesq. & James Moses of N. Am. P. 230.

On rocks along the Columbia River at Revelstoke, B.C., May 23rd, 1890. (*Macoun.*)

1075. **B. streptophyllum,** KINDB., Byrol. N. Am. & Eur. 359.

Differs from *B. Oreganum :* All leaves crowded and nearly uniform, upper not larger and not recurved, very concave. Tufts green but finally brown, less low. Capsules unknown.

On earth and rocks at Hasting ,B.C., April 6th, 1889. (*Macoun.*)

1076. **B. trichophorum,** KINDB., Bryol. N. Am. & Eur. 359.

Leaves obtusate, appressed, neither recurved nor twisted; lower leaves distant, linear-oblong, acute, upper crowded, suboval. Tufts green. Capsules unknown.

On rocks by the sea, Cadboro Bay, Victoria, Vancouver Island, May 31st, 1893. (*Macoun.*)

1077. **B. Hendersoni,** REN. & CARDT.

On earth at Esquimalt near Victoria, June 23rd, 1887, referred to *pallescens ;* at the same place in May, 1893, and on Sea's Farm, Burnside Road, May 18th, 1893. (*Macoun.*)

1078. **B. Sawyeri,** REN. & CARD.

On rocks, at Chelsea, Que., Sept. 9th, 1889. (*Macoun.*)

1079. **B. gemmascens,** KINDB., Bryol. N. Am. & Eur. 360.

Leaves small, twisted, entire, not recurved ; lower and middle distant, short-decurrent, narrowly sublingulate, acuminate acute; comal leaves glomerate to a broadly clavate bud, suboval, subobtuse. Tufts green. Capsules unknown.

On a rock by the sea at Comox, Vancouver Island, June 22nd, 1893. (*Macoun.*)

1080. **B. extenuatum,** REN. & CARD.

On earth at Hastings, B.C., April 13th, 1889; on logs, Sea's farm, near Victoria, Vancouver Island, May 6th, 1893. (*Macoun.*)

1081. **B. tomentosum,** KINDB., Bryol. N. Am. & Eur., 361.

Leaves subovate, gradually acuminate, entire, decurrent, small. Tufts brown and very tomentose below, green above, dense and rather small. Leaves short as in *B. elegans*, not recurved ; cells sub-rhombic. Dioecious. Capsules unknown.

On earth at Hector, Rocky Mountains, B.C., Aug. 14th, 1890. (*Macoun.*)

1082. **B. producticolle,** KINDB., Bryol. N. Am. & Eur., 364.

Leaves ovate-lanceolate, reflexed, distinctly limbate ; costa long-excurrent. Capsule narrow, strangulate ; neck long not curved ; lid short-apiculate ; cilia long-appendiculate. Tufts about 1 cm. high. Spores scarcely 0,02 m.m.

On earth and rocks near Victoria, Vancouver Island, May 25th, 1893. (*Macoun.*)

1083. **B. occidentale,** SULLIV. ; Lesq. & James, Mosses of N. America, p. 236.

On earth along Crow's Nest Lake, Rocky Mountains, Alta., Aug. 3rd, 1897. (*Macoun.*)

1084. **B. gemmuligerum,** KINDB., Bryol. N. Am. & Eur., 368.

Leaves subovate, obtusate, small ; those of the shoots broader, obtuse ; costa long-excurrent. Capsule brown, oblong or obovate with a short thick neck, distinctly constricted when dry, not large; teeth yellow ; segments long-fenestrate ; cilia long-appendiculate ; lid large, apiculate or mamillate. Spores about 0·01 mm. Monoecious or dioecious.

On earth, 12-Mile Lake, Wood Mountain, Assa., June 6th, 1895. (*Macoun.*)

523. **B. acutiusculum,** C. MUELL.

On earth summit of Smoky Mountain, Cape Breton Island, N.S., Aug. 3rd, 1898. (*Macoun.*)

524. **B. bullatum,** C. MUELL.

On earth by the Asulcan Glacier, Selkirk Mountains, B.C., Aug. 7th, 1890. (*Macoun.*)

1085. **B. Ferchelii,** FUNCK.

On rocks near the water above the old mill at the Cascades, Gatineau River, Que., June 23rd, 1900 ; also in the same situation on the Petewawa River, Algonquin Park, Ont., July 24th, 1900. (*Macoun.*)

1086. **B. affine,** BRUCH.

On earth east of Câche Lake, Algonquin Park, Ont., June 9th, 1900. (*Macoun.*)

1087. **B. globosum,** LINDBERG.

Newfoundland. (*Waghorne* fide *Kindberg.*)

1088. **B. microstegioides,** KINDB., Ott. Nat., Vol. XIV., p. 88.

Differs from *B. submicrostegium :* leaves short-acuminate; capsule with a large lid ; endostomial membrane very low ; cilia short and smooth.

Prybilov Islands, Behring Sea, 1891. (*Palmer.*)

RŒLLIA, Kindb., Revue Bryol., 1896.

521. **R. simplex,** KINDB.
Bryum simplex, Kindb., Cat. Can. Musci, p. 135.

Very abundant on the upper slopes of Mount Benson near Nanaimo, Vancouver Island, July 10th, 1893. (*Macoun.*)

78. ZIERIA, Schimp.

526. **Z. julacea,** SCHIMP.
Plagiobryum Zierii, (Dicks.) Lindb.

A few sterile specimens collected on earth in crevices of rock about 1000 feet above Lake Lindeman, Yukon. (*Williams.*)

1089. **Z. argenteoides,** (WILLIAMS.)
Plagiobryum argenteoides, R. S. Williams ; Bull. New York, Bot. Gar. Vol. II., p. 129.

With the appearance of *Bryum argenteum.* In dense tufts up to 1 cm. high. Stems simple or branching, vineous red, radiculose below, in cross-section showing an outer wall of one layer of irregular, somewhat thick-walled cells, with ground tissue of very large, thin-walled cells, becoming smaller toward center and enclosing a distinct central strand. Leaves concave, appressed, broadly ovate, with short abrupt point, entire, mostly $\frac{1}{2}$ mm. long or less or occasionally the terminal leaves lanceolate pointed and up to 1 mm. long. Costa vanishing from $\frac{1}{3}$ to $\frac{2}{3}$ up. Upper $\frac{1}{3}$ of leaf usually hyaline. Alar cells and most basal cells square (sides 12 to 16 mm.) to short rectangular (1 to 2.) Median cells irregularly rhomboidal to oblong-linear, up to ·040 or ·050 mm. Cell walls somewhat thickened, especially above.

Found on bare rock in dry places on the Yukon River, just below Dawson, Yukon, March 19th, 1899. (*Williams.*)

79. MNIUM, Linn.

529. **M. venustum.** MITT.

Growing in company with *M. insigne*, in the Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

530. **M. macrociliare,** C. M. & KINDB.

On rocks, Brulé Lake, Algonquin Park, Ont., June 13th, 1900. (*Macoun.*)

Mrs. Britton says of the specimen cited from Northumberland Co., Ont., in part VI., p. 137, that it is a mixture of *M. cuspidatum*, *M. serratum*, Schw. and *M. affine* var. *ciliare* (Grev.)

531. **M. Drummondii,** BRUCH & SCHIMP.

Shady banks at Edmonton, Ont., June, 1893. (*Jas. White.*) On the bases of trees in the Cypress Hills, June, 1895 ; on earth in a ravine, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898 ; in earth in a ravine, Woodstock, N. B., July, 1899 ; Câche Lake, Algonquin Park, Ont., 1900. (*Macoun.*)

532. **M. rostratum,** SCHWAEGR.

On shady rocks, Credit Forks, Ont., Aug., 1893. (*Jas. White.*) On a large boulder in Rockcliffe Park, Ottawa, Ont., April, 1896; on rocks, Lake Agnes, Rocky Mountains, Aug., 1891; on the Elbow divide, Rocky Mountains, 1897 ; on boulders in woods Algonquin Park, Ont., June, 1900. (*Macoun.*)

533. **M. medium,** BRUCH & SCHIMP.

On earth, Hunter's River, Prince Edward Island, July, 1888 ; on wet rocks, New Westminster, B.C., May, 1875 ; on rocks, in a brook, at Revelstoke, B.C., May, 1890. The last reference appeared in Part VI., p. 141, as *M. umbratile.* (*Macoun.*) Left bank of Klondike River, just below Bonanza Creek, not common; also collected at Skagway, growing abundantly under the heavy evergreen forests. (*Williams.*)

534. **M. affine,** BLAND.

Along the Skeena River, B.C., May, 1892. (*J. M. Macoun.*) Wet woods, Edmonton, Ont., July, 1892. (*Jas. White.*) Around springs in the Cypress Hills, June, 1894 ; Dry Cañon, Devil's Lake, Banff, Rocky Mountains, Aug. 10th, 1891 : in wet woods, Algonquin Park, Ont., 1900. (*Macoun.*)

1090. **M. ciliare,** GREVILLE.

Shaded places along the Tobique River, N.B., July, 1884. (*G. U. Hay.*) On earth along a brook, Big Intervale, Margaree, Cape

Breton, July, 1898; in woods in a swamp at Wyoming, Lambton Co., Ont., June 14th, 1901. (*Macoun.*)

553. **M. rugicum,** LAWR.

In bogs by Clearwater River, northern Labrador, July 9th, 1896. (*A. P. Low.*) Head of Lake Bennett, Yukon. (*Williams*)

1091. **M. robustum,** KINDB., N. Sp.

M. insigne var. *intermedium*, Kindb.; Cat. Can. Musci, p. 139.

Leaves not at all or very short-decurrent. Synœcious. Otherwise, as in *M. insigne.*

Common on Cedar Hill, near Victoria, Vancouver Island, April 17th, 1887. (*Macoun.*)

537. **M. hornum,** LINN.

Rather common on Cape Breton Island, N.S., at Louisburg, Baddeck, Sydney and Margaree, July, 1898; very abundant on Sable Island, N.S., July, 1899. (*Macoun.*)

538. **M serratum,** BRID.

M. marginatum, Dicks.; Kindb., Bryol. N. Am. & Eur., 343.

Klondike River, near the mouth of Bonanza Creek, Yukon, June 18th, 1899. (*Williams.*)

539. **M. orthorhynchum,** BRUCH & SCHIMP.

Amongst rocks, Unalaska Island, Behring Sea, June, 1897. (*J. M. Macoun.*) On rock and earth, Bragg's Creek, Elbow River, Rocky Mountains, July, 1897. (*Macoun.*) Salmon Creek, near Juneau, Alaska. (*Miss G. Cooley.*) Dawson, Yukon, in good fruit, July 16th, 1899. (*Williams.*)

541. **M. pseudo-lycopodioides,** C. M. & KINDB.

On the bases of trees, Credit Forks, Ont., Sept., 1892. (*Jas. White.*) On earth and rocks by a brook, Meech's Lake, Chelsea, Que., Sept., 1893; on earth along Bragg's Creek, Elbow River, Rocky Mountains, July 1897. (*Macoun.*)

542. **M. inclinatum,** LINDB.

On earth on rocks along Bragg's Creek, Rocky Mountains, July, 1897 ; on rocks in the "Dry Cañon," Devil's Lake, Rocky Mountains, Aug., 1891. (*Macoun.*)

543. **M. umbratile,** MITT.

On rocks in a ravine at Goldstream, near Victoria, Vancouver Island, June, 1893. (*Macoun.*)

544. **M. spinulosum,** BRUCH & SCHIMP.

On earth, South Kootanie Pass, Rocky Mountains, July, 1883. (*Dr. G. M. Dawson.*) Dry woods, Edmonton, Ont. (*Jas. White.*) On earth at the bases of trees, Algonquin Park, Ont., 1900 ; in woods, Niagara River at Foster's Flats, Ont., May 13th, 1901. On Saddle-back Mountain, Devil's Lake, Rocky Mountains, Aug., 1891 ; on earth under trees near Victoria, on wet rocks, Mount Benson, near Nanaimo, and at the Union Mines, Comox, Vancouver Island, 1893 ; on earth, Moose Mountain, Elbow River, Rocky Mountains, July, 1897. (*Macoun.*) Lake Lindeman, Yukon. (*Williams.*)

546. **M. stellare,** HEDW.

On damp rocks, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898. (*Macoun.*)

547, **M. Blyttii,** BRUCH & SCHIMP.

Dawson, Yukon. Specimens sterile. (*Williams.*)

548. **M. cinclidioides,** HEUBEN.

In woods at Campbellton, N.B., Sept., 1882; in woods near Kakabeka Falls, west of Lake Superior, July, 1869. Both these specimens were referred to *M. punctatum* in Cat. Can. Musci, p. 143; in a springy place, Red Pine Lake, Algonquin Park, Ont., July 21st, 1900. (*Macoun.*) Dawson, Yukon. (*Williams.*)

549. **M. punctatum,** HEDW.

Rather common on earth and in bogs at Baddeck, Margaree, and Half-Way Brook, Cape Breton Island, N.S., July, 1898 ; in a

bog, Union Mines, Comox, Vancouver Island, June, 1893; on earth in a ravine at Woodstock, N.B., July, 1899; in wet places, Algonquin Park, Ont., 1900. (*Macoun.*) Unalaska Island, and Kadiak Island, Behring Sea, Aug., 1891. (*J. M. Macoun.*) Lake Lindeman. (*Williams.*) Loring, Sitka ; Salmon Creek, near Juneau ; near the snow line above the basin. (*Miss G. Cooley.*)

1092. **M. glabrescens,** KINDB., Note on Canad. Bryol., 1893.

Leaves oval-lingulate, green or pale red, not nigrescent ; the uppermost suboblong or oblong-lanceolate ; cells smaller than in *M. punctatum.* Perichetial leaves as in *M. subglobosum.* Stem nearly glabrous. Pedicel longer than in *M. punctatum.*

On earth and old logs in woods at Port Etches and Sitka, Alaska; also on Carmanah Point, Vancouver Island, 1892. (*J.M. Macoun.*) On old logs, Queen Charlotte Islands, B.C., July, 1878 ; and on earth at Comox, Vancouver Island, July, 1885. (*Dr. G. M. Dawson.*) On old logs at Victoria, Vancouver Island, May, 1875 and in May, 1893, and at Comox, Vancouver Island in April, 1887. This is a common and distinct species on Vancouver Island. (*Macoun.*)

Subsp. **chlorophyllosum,** KINDB., Bryol. N. Am. & Eur., 340.

Capsule (unripe) narrowly oblong. Leaf-cells very chlorophyllose. Stem tomentose.

On wet rocks in a brook emptying into the west side of Meech's Lake, near Chelsea, Que., Sept. 23rd, 1893. (*Macoun.*)

550. **M. subglobosum,** BRUCH & SCHIMP.

Seal Lake, northern Labrador, July, 1896. (*A. P. Low.*) In boggy places, Middleton Island, Alaska ; also on St. George and St. Paul islands, Behring Sea, 1892. (*J. M. Macoun.*) Lake Lindeman, Yukon. (*Williams.*)

551. **M. hymenophyllum,** BRYOL. Eur.

Bennett City and Dawson, Yukon. Growing in large thick tufts in damp and shady or wet places. (*Williams.*)

552. **M. hymenophylloides,** HEUBEN.

On earth, St. George Island, Behring Sea, July, 1892. (*J. M. Macoun.*) On rocks, Half-Way Brook, Cape Breton Island, N.S., Aug., 1898. (*Macoun.*)

1093. **M. arcticum,** KINDB. (1897.)

Karajak, Nunatak, Greenland. (*Vanhœffen.*)

1094. **M. riparium,** MITTEN.

Wet rocks, Rockcliffe Park, Ottawa, Ont., April, 1899; on rocks in a ravine, Woodstock, N.B., July 4th, 1899. On rocks in the Crow's Nest Pass, Rocky Mountains, August 20th, 1897. (*Macoun.*)

553. **M. Menziesii,** C. MUELL.

Leucolepis acanthoneura, SCHW.; Kindb., Byrol. N. Am. & Eur. 335.

Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

80. CINCLIDIUM, Swartz.

554. **C. stygium,** SWARTZ.

Common in swampy places at Dawson, Yukon. In fine fruit, July 9th, 1899. (*Williams.*)

555. **C. subrotundum,** LINDB.

Fort Chimo, Ungava Bay, Labrador, Sept., 1896. (*A. P. Low.*) On wet earth at Truro, N.S., June, 1883. (*Macoun.*) Head of Lake Bennett, Yukon, about springs. Tufts often 9 cm. high. (*Williams.*)

1095. **C. Macounii,** KINDB., Revue Bryol, 1896.

Stem-leaves round-spathulate finally blackish; shoot-leaves pale red or greenish, lingulate, generally obtuse. Capsule subovate. In a bog at Stephen by the "Great Divide" summit of the Rocky Mountains, B.C., July 23rd, 1885; in a bog north of Prince Albert, Sask., July 3rd, 1896. (*Macoun.*)

81. AULACOMNIUM, Schwaegr

556. **A. androgynum,** SCHWAEGR.

On earth in woods, Câche Lake, Algonquin Park, Ont., 1900, on banks above Leamington, Essex Co., Ont., May 25th, 1901; on old logs at Revelstoke, B.C., May, 1890. (*Macoun.*) Chilli-

wack Valley, B.C., 1901. A form with short leaves ; on old logs along the Skeena River, B.C., May, 1892. (*J. M. Macoun.*)

557. **A. palustre,** SCHWAEGR.

North shore of Hudson Strait, Baffin's Land, 1897. (*Dr. R. Bell.*) In swamps at Edmonton, Ont., 1893. (*Jas. White.*) Boggy ground, Lat. 61°, Long. 104°, W., 1893, also Pike's Portage, Great Slave Lake, May 25th, 1900. (*J. W. Tyrrell.*) Bogs, northern Labrador, 1897. (*A. P. Low.*) Boggy places, Sable Island, N.S., Aug., 1899 ; in wet woods, Baddeck, and on Smoky Mountain, Cape Breton Island, N.S., 1898 ; in bogs, Algonquin Park, Ont., 1900 ; in a peat bog at Galt, Ont. ; in wet woods, Niagara Falls, Ont., 1901 ; along Jumping Pound Creek, Rocky Mountains, Alta. (*Macoun.*) Mouth of Little Salmon River, Yukon. Fruiting, June 16th. (*Williams.*)

Var. **imbricatum,** BRUCH & SCHIMP.

Very common in wet places at Dawson, Yukon. (*Williams.*)

558. **A. turgidum,** SCHWAEGR.

On wet ground, Fort Chimo, Ungava Bay, Labrador, Aug., 1896. (*A. P. Low.*) Sheep Camp, Dyea Creek, Alaska ; sterile ; Dawson, Yukon, very abundant ; fruiting. (*Williams.*)

82. TIMMIA, Hedw.

560. **T. megapolitana,** HEDW.

Marsh Lake and Klondike River, near its mouth. This species seems to grow mostly on rather dry earth at the base of rock ledges somewhat at a higher elevation than the next. The capsule is nearly straight and furrowed when dry. (*Williams.*)

1096. **T. cucullata,** MICHX.

Yukon River, just above Dawson, Yukon, growing at the base of trees. This species is quite distinct from *megapolitana.* It differs from *megapolitana* in the wider mouthed capsule, more curved and smooth when dry. (*Williams.*)

561. **T. Austriaca,** HEDW.

On earth, Moose Mountain, Elbow River, Rocky Mountains, July, 1897. (*Macoun.*) Cañon City, Dyea Creek, and Moose Creek, just below Dawson. (*Williams.*)

1097. **T. arctica,** KINDB. Botan. Notiser, 1893.

Greenland. (*Berggren.*)

1098. **T. Bavarica,** HESSLER.

On rocks at Morley, foothills of Rocky Mountains, June 13th, 1885; near Fort St. James, northern British Columbia, June 21st, 1875; on rocks near Victoria, Vancouver Island, May 7th, 1875. All these were included in *T. megapolitana* in Cat. Can. Musci., p. 146. On limestone rocks, Foster's Flats, Niagara Falls, 1901. (*Macoun.*)

1099. **T. Macounii,** KINDB., N. Sp.

On rocks, Moose Mountain alt. 7500 feet, Elbow River, Rocky Mountains, July 4th, 1897. (*Macoun.*)

83. ATRICHUM, Beauv.

563. **A. undulatum** BEAUV.

Catharinea undulata, (LINN). ; Kindb., Bryol. N. Am. & Eur. 154.

On earth at Blueberry Point, Alymer, and Meech's Lake, Que., 1900 ; also on wet earth, Rainy Lake, Algonquin Park, Ont., 1900. (*Macoun.*) Juneau, Alaska. (*Miss G. Cooley.*)

564. **A. angustatum,** BRUCH & SCHIMP.

Catharinea augustata, BRID. ; Kindb., Bryol. N. Am. & Eur. 154.

On sandy and damp earth north of Beechwood, Ottawa, Ont., 1899 ; on sandy earth, Algonquin Park, Ont., 1900 ; on earth in woods, Queenston Heights, Niagara River, Ont., 1901. (*Macoun.*)

565. **A. Selwyni,** AUST.

Catharinea Selwyni, AUSTIN ; Kindb., Bryol. N. Am. & Eur. 153.

On earth in woods, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898; on damp earth at Woodstock, N.B., July,

1899 ; on a sandy bank north of Beechwood Cemetery, Ottawa, Ont., Nov. 1st, 1900. I am doubtful of the correctness of the above references.

1100. **A. Haussknechtii,** JURATZKA & MILDE.

On earth in Newfoundland. (*Waghorne.*) On earth, Rustico Bay, Prince Edward Island, July, 1888 ; on earth and rocks, Half-Way Brook, Cape Breton Island, N.S., Aug. 1898.

569. **A. leiophyllum,** KINDB.

Port Etches, Alaska, Lat. 60° 30′, June 18th, 1892. (*J. M. Macoun.*)

85. PSILOPILUM, Brid.

574. **P. arcticum,** BRID.

Left bank of Klondike River, just below Bonanza Creek ; on damp black soil of hillside. Not fruiting. (*Williams.*)

86 POGONATUM, Beauv.

575. **P. brevicaule,** BEAUV.

Polytrichum Pennsylvanicum, HEDW.; Kindb., Bryol. N. Am. & Eur. 158.

On earth at Half-Way Brook and Baddeck, Cape Breton Island, N.S., 1898 ; on a sandy bank north side of Beechwood Cemetery, Ottawa, Ont., Oct., 1900. (*Macoun.*)

576. **P. capillare,** BRID.

Polytrichum capillare, RICHARD ; Kindb., Bryol. N. Am. & Eur. 159.

Salmon Creek, near Juneau. (*Miss G. Cooley.*) This is probably *P. dentatum.*

578. **P. contortum,** (MENZIES) LESQ.

Catharinella contorta, MENZIES ; Kindb., Bryol. N. Am. & Eur. 157.

On earth, Nagai Island, Alaska, Sept. 18th, 1892. (*J.M.Macoun.*) Loring, Sitka. (*Miss G. Cooley.*)

580. **P. atrovirens,** MITT.

Catharinella atrovirens, MITT ; Kindb., Bryol. N. Am. & Eur. 157.

On earth in Stanley Park, Vancouver City, B.C., 1893. (*Macoun.*) *Law.*) Reported as *P. erythrodontium*, in Part VI., p. 150.

581. **P. urnigerum,** BEAUV.

Polytrichum urnigerum, LINN.; Kindb., Bryol. N. Am. & Eur. 158.

On earth at Baddeck, Grand Narrows, and Louisburg, Cape Breton Island, N.S., 1898; abundant on roadside cuttings, Edmunston, N.B., Sept., 1899. (*Macoun.*) Stillwater River, Labrador, 1896. (*A. P. Low.*) Port Etches, Alaska, Lat. 60° 30′, 1892. (*J. M. Macoun.*) Juneau, alt. 3,000 feet ; also at Salmon Creek and Gold Creek Cañon, Juneau, Alaska. (*Miss G. Cooley.*)

582. **P. alpinum,** ROEHL.

Polytrichum alpinum, L.; Kindb., Bryol. N. Am. & Eur., 160.

Not rare at Baddeck, Louisburg and Margaree, Cape Breton Island, N.S., 1898 ; crevices of rocks at Meech's Lake, Que., and Hogsback, near Ottawa, Ont., 1897. (*Macoun.*) Port Etches, Alaska, Lat. 60° 30′, 1892. (*J. M. Macoun.*) Juneau, 3000 feet alt. ; also at Salmon Creek and Sheep Creek, near Juneau, Alaska. (*Miss G. Cooley.*) Sheep Camp, Dyea Creek, Alaska ; and Lindeman, Yukon. (*Williams.*)

Var. **subcylindricum,** KINDB.

Koksoak River, northern Labrador, Aug. 21st, 1896. (*A. P. Low.*)

583. **P. Macounii,** KINDB.

Polytrichum Macounii, Kindb., Bryol. N. Am. & Eur. 159.

On rocks at the mouth of the Skeena River, B.C., May, 1892 ; mountains at Chilliwack Lake, B.C. (*J. M. Macoun.*)

87. POLYTRICHUM, Linn.

585. **P. sexangulare,** FLOERKE.

On the mountains above Chilliwack Lake, B.C., 1901. (*J. M. Macoun.*)

586. **P. gracile,** MENZIES.

Wet rocks, Tobique River, N.B., July, 1884. (*G. U. Hay.*) Referred in Part VI., p. 151, to *P. alpinum.* Swampy places at Edmonton, Ont., July, 1893. (*Jas. White.*) Fort Chimo, Labrador, Aug. 1896. (*A. P. Low.*) Table Top Mountain, Gaspé Que., Aug., 1882, referred in Part VI., p. 151 to *P. alpinum* ; very abundant in woods throughout the Algonquin Park, Ont., July, 1900. (*Macoun.*) Yukon River, just below White Horse Rapids, Yukon. (*Williams.*)

588. **P. Ohioense,** REN. & CARD.

On earth at Baddeck, Half-way Brook, Margaree and Louisburg, Cape Breton Island, N.S., 1898 ; on earth in beech woods, Leamington, Essex Co., Ont., May, 1901. (*Macoun.*) Moist woods, Edmonton, Ont., 1893. (*Jas. White.*)

590. **P. piliferum,** SCHREB.

Lake Lindeman, Yukon. (*Williams.*) Chilliwack Valley, B C., 1901. (*J. M. Macoun.*)

1101. **P. microdontium,** KINDB., in Biblioth. Botan. 42 (1897). *Pogonatum alpinum*, var. *microdontium*, Kindb. ; Cat. Can. Musci, p. 152.

On St. George and Atka islands, Behring Sea, 1892 ; also at the mouth of Skeena River, B.C., May, 1892. (*J. M. Macoun.*)

1102. **P. Vanhoeffeni,** KINDB. in Biblioth. Botan. 42 (1897).

Rather rare in Greenland. (*Vanhoeffen.*)

591. **P. hyperboreum,** R. BROWN.

On earth near Fort Chimo, Ungava Bay, Labrador, Aug., 1896. (*A. P. Low.*) Lake Lindeman, Yukon. This plant has a white hair-point like *piliferum* but grows up to 8 cm. or more, with abundant branches. (*Williams.*)

592. **P. boreale,** KINDB.

On rocks, Mosquito Bay, Labrador, Lat. 61° 25′, Aug. 13th, 1898. (*A. P. Low.*)

1103. **P. Behringianum,** KINDB., Revue Bryol. 1894.

On boggy ground, St. Paul Island, Behring Sea, July, 1892. (*J. M. Macoun.*) On the summit of Sulphur Mountain, Banff, Rocky Mountains, July, 1891. (*Macoun.*) The last specimen is very doubtful.

593. **P. juniperinum,** WILLD.

Quite common in all parts of the country about stumps in pastures, and meadows and woods. (*Macoun.*) Lake Lindeman, Yukon. (*Williams.*)

594. **P. strictum,** BANKS.

Sheep Camp and Dyea Creek, Alaska, and Lake Lindeman, Yukon. (*Williams.*)

595. **P. commune,** LINN.

The var. *minus* is common in a damp thicket at Leamington, Essex Co., Ont. (*Macoun.*) Lake Lindeman and Dawson, Yukon. At the latter place in fine fruit, July 30th, 1899. (*Williams.*)

1104. **P. inconstans,** HAGEN.

Stems slender, up to 8 cm. high, rather uniformly leaved above with a felt of dark red radicles below. Leaves somewhat distant, irregularly spreading, up to 6 mm. long, lanceolate with costa scarcely or short-excurrent and margins minutely serrulate. Lamellæ up to about 24, the median from 5 to 9 cells high, terminating in 1 or sometimes 2 cells, transversely oblong in section about twice wider than high and not or scarcely depressed. Blade of leaf-bearing lamellæ on either side of costa of only two layers of cells thick with cell walls on back of leaf not thickened. Leaf-cells in blade between base of lamellæ and margin of leaf mostly from ·012 by ·016 mm. to ·016 by ·020 mm.

Collected at Lake Lindeman in swampy places, May 26th, 1898. (*Williams.*)

88. DIPHYSCIUM, Mohr.

596. **D. foliosum,** MOHR.

D. sessile, SCHMID.; Kindb., Bryol. N Am. & Eur. 391.

Abundant on clay banks, Big Intervale, Margaree, Cape Breton Island, N.S., July 22nd, 1898 ; on earth on rocks, Câche Lake, Algonquin Park, Ont., July, 1900. (*Macoun.*)

89. BUXBAUMIA, Hall.

1105. **B. indusiata,** Bridel ; Kindb., Bryol. N. Am. & Eur. 391.

This species was included in *B. aphylla*, in Part VI., p. 157. I am obliged to Mrs. G. E. Britton for the determination of the species. It has only been found on old logs in damp woods. Above Revelstoke on the Columbia, May 13th, 1890; at Hastings, B.C., April 27th, 1889 ; also near Victoria, Vancouver Island, May 19th, 1893. (*Macoun.*)

90. FONTINALIS, Dill.

1106. **F. gigantea,** Sulliv.

In a plaster pit, Big Intervale, Margaree, and in a brook, near Louisburg, Cape Breton Island, N.S., 1898; in a brook at Woodstock, N.B., 1899 ; on stones in brooks, Algonquin Park, Ont., 1900; in the Courtney River at Comox, Vancouver Island, July, 1893. (*Macoun.*)

1107. **F. Kindbergii,** Ren. & Card.

In pools along Peace River near Dunvegan, Atha., Lat. 56°, October, 1872. Referred to *antipyretica*, in Part VI.; in Beaver Meadow Creek, Hull, Que., June, 1898. (*Macoun.*)

599. **F. Neo-Mexicana,** Sulliv. & Lesq.

In the creek entering the Columbia at Revelstoke, from Eagle Pass, B.C., May, 1890. Referred in Part VI. to *F. biformis* ; on stones in the Courtney River at Comox, Vancouver Island, June, 1893. (*Macoun.*) Brook by Chilliwack Lake, B.C., 1901. (*J. M. Macoun.*)

600. **F. Dalecarlica,** Schimp.

On stones in the Koaksoak River, Ungava, Labrador, Aug. 1896. (*A. P. Low.*) On stones in brooks at Margaree and Half Way Brook, Cape Breton Island, N.S., July, 1898 ; on stones in a brook at Woodstock, N.B., July, 1899. (*Macoun.*)

601. **F. biformis,** Sulliv.

On stones in the Madawaska River, Algonquin Park, Ont., July 4th, 1900. (*Macoun.*)

602. **F. Novæ-Angliæ,** Sulliv.

On stones in brooks at Halifax, N.S., June, 1883. Referred in Part V . to *F. Neo-Mexicana* ; on stones in the Scootamata River, North Hastings, Ont., July, 1870. (*Macoun.*)

Subsp. **involuta,** Ren. & Card. ; Kindb., Bryol. N. Am. & Eur., 147.

On stones in Joe Creek, Algonquin Park, Ont., July 17th, 1900 (*Macoun.*)

603. **F. disticha,** Hook. & Wils.
F. Lescurii, Sulliv. ; Kindb., Bryol. N. Am. & Eur., 146.

In brooks along Nipigon Lake, Ont., July, 1884 ; also along Telegraph Trail, Blackwater River, B.C., June, 1875. (*Macoun.*)

604. **F. hypnoides,** Hartm.

On trees subject to flood along Lake Duchesne, above Britannia, near Ottawa, Ont., Oct. 27th, 1900 ; on rocks in the Petewawa River, Algonquin Park, Ont., July 24th, 1900 ; near Victoria, Vancouver Island, May, 1875. The above specimen was referred to *F. disticha* in Part VI. Cat. Can. Musci, p. 159. (*Macoun.*)

605. **F. squamosa,** Linn.

Abundant and in fine fruit on stones in a brook, Long Portage, Petewawa, River, Algonquin Park, Ont., July 25th, 1900 ; on rocks along the Bonnechere River, at Golden Lake, Ont., Sept. 26th, 1900. (*Macoun.*)

Subsp. **Delamarei,** Ren. & Card.
F. squamosa, Linn. ; Cat. Can. Musci, p. 159.

On stones in a brook, near Aspy Bay, Cape Breton Island, N.S., Aug., 1898. (*Macoun.*)

1108. **F. seriata,** Lindb. Kindb., Bryol. N. Am. & Eur., 148.

On rocks in a brook, Half Way House, Cape Breton Island, N.S., Aug., 1898. (*Macoun.*)

1109. **F. nitida,** LINDB. & ARN.

In brooks near Belleville, Hastings Co., Ont., May, 1871 ; referred to *F. hypnoides* in Part VI. ; in pools along Peace River, below Dunvegan, Oct., 1872, referred to *F. disticha* in Part VI (*Macoun.*)

91. DICHELYMA, Myrin.

609. **D. pallescens,** BRYOL. EUROP.
D. obtusulum, KINDB.; Cat. Can. Musci, p. 160 is merged in this species.

On the bases of trees in flooded lands at Golden Lake, Ont., Sept., 1900. (*Macoun.*)

1110. **D. falcatum,** (HEDW.) MYRIN.,
D. capillaceum var. *elongatum*, KINDB.; Cat. Can. Musci. p. 160.

In the bed of a small brook 30 miles north of Michipicotin River, Lake Superior, July 27th, 1869. (*Macoun.*) Coast of Labrador. (*Waghorne.*) On wet banks, Lake Lindeman, Yukon In fine fruiting tufts up to 11 cm. high. (*Williams.*)

92. LEPTODON, Mohr.

611. **L. trichomitrium,** MOHR.
Fosstræmia trichomitria, HEDW.; Kindb., Bryol. N. Am. & Eur. 7.

On black ash and basswood trees at Edmonton, Ont., July, 1892; also on trees, Credit Forks, Ont., 1893. (*Jas. White.*)

94. NECKERA, Hedw.

614. **N. Menziesii,** DRUMM.

Cañon City and Dyea Creek, Alaska. (*Williams.*) Rather common, Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

615. **N. pennata,** (LINN.) HEDW.

Sheep Camp, Dyea Creek, Alaska. On a cotton-wood. (*Williams.*

516. **N. oligocarpa,** Bruch.

Specimens collected at Rustico Bay, Prince Edward Island, and at Ottawa, Ont., referred here in Part VI., Cat. Can. Musci belong to *N. pennata.* On rocks in the "Dry Cañon," Devil's Lake, Rocky Mountains, Aug., 1891. (*Macoun.*)

1111. **N. pterantha,** C. M. & Kindb.
N. oligocarpa pterantha, Cat. Can. Musci, p. 162.

In crevices of rock, fruiting abundantly, at Dawson, Yukon. Secondary stems scarcely branching. (*Williams.*)

617. **N. Douglasii,** Hook.

Rather common on trees in the Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

618. **N. complanata,** (Linn.) Heuben.

On rocks in a ravine at Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898. (*Macoun.*)

95. HOMALIA, Brid.

619. **H. Macounii,** C. M. & Kindb.
Neckera Macounii, C. M. & Kindb.; Kindb., Bryol, N. Am. & Eur. 19.

Common on rocks at Aroostook Falls and Woodstock, New Brunswick, 1899.

1112. **H. Jamesii,** Schimp.; Lesq. & James Mosses of N. America, 285,
Neckera Jamesii, Schimp.; Kindb., Bryol. N. Am. & Eur., 19.

On rocks, Newfoundland. (*Waghorne.*) On steep rocks in a ravine, Big Intervale, Margaree, Cape Breton Island, N S., July, 1898. (*Macoun.*)

98. PTERIGYNANDRUM, Hedw.

623. **P. filiforme,** Hedw.

Abundant on rocks, Moose Mountain, Alta., 1897. (*Macoun.*) On trees at Sheep Camp, Dyea Creek, Alaska. (*Williams.*)

Subsp. **decipiens,** (WEB. & MOHR.) LIMPR.

On rocks, Newfoundland. (*Waghorne.*) On rocks at Margaree and Half Way Brook, Cape Breton Island, N.S., 1898. (*Macoun.*) On rock, Lake Lindeman, Yukon. (*Williams.*)

99. PTEROGONIUM, Swartz.

625 **P. brachypterum,** MITT.

Lindbergia brachyptera, Mitt.; Kindb., Bryol. N. Am. & Eur., 13.

On the trunk of *Ostrya Virginica,* near Hemlock Lake, Beechwood, Ottawa, Ont., May 16th, 1900. (*Macoun.*)

HYPOPTERYGIUM, Bridel.

1113. **H. canadense,** KINDB., Revue Bryol.; 1899, 2.

Branch-leaves small, crowded and appressed, broadly ovate-apiculate, dentate nearly all around, narrowly limbate by hyaline narrow cells; other cells subrhombic, about 0.02 mm.; costa short; amphigastria rotundate, dentate limbate; costa confluent with the point. The naked part of the stem about 1 cm., the upper one scarcely longer. Capsules and male plants unknown.

On rocks near the coast in company with *Asplenium viride,* Skiddegate, Queen Charlotte Islands. Apparently rare. June, 1898., B.C. (*Dr. C. F. Newcombe.*)

100. ANTITRICHIA, Brid.

1114. **A. gigantea.** (SULLIV. & LESQ.) KINDB., Revue Bryol. 1895. *A. curtipendula,* Brid. var. *gigantea,* Cat. Can. Musci, p. 165.

On trees at Dyea Creek; on rocks at Skagway, Alaska. All sterile. (*Williams.*)

628. **A. Californica,** SULLIV.

Macouniella Californica, Sulliv.; Kindb. Bryol. N. Am. & Eur., 21.

Dyea and Dyea Creek, Alaska; fruiting. (*Williams.*)

101. PTERYGOPHYLLUM, Brid.

629. **P. lucens,** (LINN.) BRID.

Port Etches, Alaska, Lat. 60° 30′, June, 1892. (*J. M. Macoun.*)

102. FABRONIA, Raddi.

1115. **F. Ravenelii,** Sulliv.; Lesq. & James Mosses of N. America, 295.

On earth at Old Wives' Creek and Wood Mountain, Assa., June, 1895. (*Macoun.*)

104. MYURELLA, Bruch & Schimp

634. **M. julacea,** (Vill.) Bruch & Schimp.

On rock, head of Lake Bennett, sterile; about roots of trees in damp places about Dawson. In fine fruit, April 23rd, 1899. (*Williams.*)

635. **M. apiculata,** Bruch & Schimp.
M. tenerrima, Brid.; Kindb., Bryol. N. Am. & Eur., 45.

On earth at the foot of rock ledges at Dawson, Yukon; in fruit. (*Williams.*)

636. **M. Careyana,** Sulliv.
M. gracilis, Weinmann; Kindb., Bryol. N. Am. & Eur., 45.

On the face of rocks and earth along Credit River, near Credit Forks, Ont., October, 1892. (*Jas. White.*) On rocks in a ravine, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898. (*Macoun.*)

105. LESKEA, Hedw.

This genus has been revised by Dr. G. N. Best, Rosemount, New Jersey, and the changes made below are copied from his work.

637. **L. polycarpa,** Ehrh., var. **paludosa,** (Hedw.) Sch.

On trees, Niagara Falls, Ont., June 15th, 1884; on trees subject to inundation, Kamloops, B.C., June 29th, 1889. The above were referred to *L. polycarpa*, in Part VI., p. 168.

All specimens referred to *L. subobtusifolia*, Kindb., Part VI., p. 169 are also placed here. (*Macoun.*)

638. **L. subobtusifolia,** C. M. & KINDB.

On the bases of trees in inundated woods at Golden Lake, Ont., Sept. 27th, 1900. (*Macoun.*)

640. **L. nervosa,** MYRIN. var. **bulbifera,** (BRID.) BEST.

On rocks at the mouth of Michaud River, Rimouski Co., Que., Aug. 8th, 1881. (*Allen.*) On rocks, Buffalo Lake, Atha., Aug. 8th, 1888. (*J. M. Macoun.*) Both referred in Part VI., p. 169 to *L. nervosa.*

642. **L. pulvinata,** WAHL.

Roots of trees, Lac Bean, St. Francis River, July 10th, 1882; also on roots of trees, Tobique River, N.B., July, 1884. (*G. U. Hay.*) Both of the above were referred to *L. polycarpa* in Part VI., p. 168.

643. **L. Wollei,** AUST.

On rocks, Jumping Pound Creek, Rocky Mountains, Alta., June 14th, 1897. (*Macoun.*)

1116. **L. obscura,** HEDW.; Lesq. & James, Mosses of N. Am. 301.

On trees two miles above the railway bridge above Trenton, Ont., on the west side, Aug. 25th, 1866, referred to *L. polycarpa* in Part VI., p. 168; on bark of trees at Woodstock, N.B., July, 1899. (*Macoun.*)

1117. **L. intermedia,** BEST.

On trees near the Great Trenton boulder above Trenton, Ont., Aug. 25th, 1866. (*Macoun.*)

106. LESCURÆA, Schimp.

1118. **L. frigida,** KINDB.; Eur. & N. Am. Bryol., p. 26.

Leaves from a subovate base gradually narrowed to the long-subulate or filiform-pointed acumen, recurved to it and distinctly decurrent; cells sublinear except the quadrate alar cells; costa sometimes long-excurrent. Stem-leaves generally entire; branch-leaves serrulate at the whole acumen, sometimes short-acuminate and faintly mamillose. Capsules unknown. Stem subpinnate. Tufts dark brown or blackish, not glossy. Very distinct in its serrulate branch leaves and very narrow leaf cells.

On earth and rocks, Clearwater Lake, northern Labrador, July 31st, 1896. (*A. P. Low.*)

107. ANOMODON, Hook. & Taylor.

1119. **A. platyphyllus,** KINDB., Note on Can. Bryol., 1893.
A. obtusifolius, Cat. Can. Musci, p. 171 in part.

Leaves short, very broad, ovate or ovate-oblong, or from a cordate strongly papillose base slightly contracted to a lingulate blunt acumen. Perichetial leaves with subdentate strongly papillose base and narrow lingulate acumen. Capsule small, oval-oblong; segments rudimentary; lid short-conic, not apiculate; pedicel yellow very much shorter than in *A. apiculatus.*

On trees in woods west of the Beaver Meadow, west of Hull, Que., Oct., 1884; on trees in swamps at Belleville, Hastings Co., Ont., 1868. (*Macoun.*)

648. **A. apiculatus,** BRUCH & SCHIMP.

On rocks in woods, Câche Lake, Algonquin Park, Ont., June 9th, 1900. (*Macoun.*)

649. **A. viticulosus,** (LINN.) HOOK. & TAYL.

On a limestone ledge, Havelock, King's Co., N.B. (*J. Moser.*) Limestone rocks, Credit Forks, Ont., Sept., 1892. (*Jas. White.*) On rocks in a ravine, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898. (*Macoun.*)

650. **A. heteroideus,** C. M. & KINDB.

On limestone rocks, Credit Forks, Ont., Sept. 1892. (*Jas. White.*) On flat limestone rocks, Meech's Lake, near Chelsea, Que., Sept., 1893. (*Macoun.*)

1120. **A. glabellus,** KINDB.

On rocks, Moose Mountain, alt. 7000 feet, Elbow River, Rocky Mountains, July 1st, 1897. (*Macoun.*)

1121. **A. Moseri,** KINDB., Note on Can. Bryol., 1893.

Leaves as in *A. nervosus* but smaller; cells more rotundate. Perichetial leaves narrowly ovate-oblong, obtusate or short-

acuminate, denticulate at least above the middle. Capsule lanceolate-cylindric, small mouthed; teeth pale; segments as high with a distinct basal membrane; lid apiculate; pedicel twice longer than in *A. nervosus*.

1122. **A. tectorum,** AL. BRAUN.

On rocks, Greenland. (*Berggren* fide *Kindberg.*) On rocks, Moose Mountain alt. 7500 feet, Elbow River, Rocky Mountains, July, 1897. (*Macoun.*) On rock in rather dry places, lakes Lebarge and Dawson, Yukon. (*Williams.*)

1123. **A subrigidulus,** KINDB., Bryol. N. Am. & Eur., 11.

Differs from *A. tectorum* in the leaves being more distinctly recurved to the short acumen; middle cells round-oval; costa generally reaching to the acumen. Stem irregularly divided, not creeping. Capsule and lid as in *A. tectorum*; peristome not seen. On rocks on the coast of Labrador. (*Waghorne.*)

108. PLATYGYRIUM, Bruch & Schimp.

651. **P. repens,** BRUCH & SCHIMP.

On old logs, Golden Lake, Ont., Sept. 27th, 1900. (*Macoun.*)

109. PYLAISIA, Bruch & Schimp.

652. **P. polyantha,** (SCHREBER) BRUCH & SCHIMP.

On trees at Credit Forks, and Edmonton, Ont., Oct., 1893. (*Jas. White.*) On old logs, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898; on old logs, Otter Slide Creek, Algonquin Park, Ont., 1900; also at Golden Lake, Ont., 1900; on the bases of trees in woods, Elbow River, Rocky Mountains, July, 1897. (*Macoun.*) Sheep Camp, Dyea Creek, on wood, Alaska; at the bases of trees at Dawson. (*Williams.*)

Var. **rupestris,** BEST, N. var.

In thin loose mats, deep to dark green; stems prostrate, irregularly branched; stem leaves ovate-lanceolate, narrowly acuminate, subcomplanate, falcato-secund, spreading-incurved, entire, costa obsolete, ·25 to ·35 mm. wide, ·6 to ·9 mm. long; median leaf cells linear-rhomboidal, 4 to 6 times as long as wide; alar cells pale,

oblong-quadrate, not numerous; pedicels slightly roughened; peristome as in type. With the appearance of a *Plagiothecium*.

On limestone rocks, Ottawa, Canada. (*Macoun.*)

654. **P. pseudo-platygyrium,** KINDB.

On the bases of trees at Baddeck, Cape Breton Island, N.S., July, 1898; on old logs at Leamy's Lake, near Hull, Que., Nov., 1896. (*Macoun.*)

1124. **P. cyrtophylla,** KINDB., Bryol. N. Am. & Eur. p. 60.

Leaves broad-ovate, generally obtusate, obtuse, not or slightly recurved; cells oval, larger than in *P. intricata*. Branches crowded. Tufts green. Capsules unknown.

On old logs by the Peace River, Atha., above Dunvegan, Oct., 1872. (*Macoun.*)

1125. **P. subdenticulata,** SCHIMP.; Lesq. & James, Mosses of N. America, 308.

On trees, Newfoundland. (*Waghorne.*)

655. **P. Selwynii,** KINDB.

On an old log fence, Blueberry Point, Aylmer, Que., April 17th, 1900. *Macoun.*)

656. **P. Ontariensis,** C. M. & KINDB.

On old logs, Port Dover, Ont., Sept. 24th, 1890. This specimen was referred to *P. intricata,* in Part VI. On trees, Rustico Bay, Prince Edward Island, July 3rd, 1888. This specimen was referred to *P. polyantha* in Part VI. (*Macoun.*) On trees at Edmonton and Credit Forks, Ont., 1892. (*Jas. White.*)

Dr. A. J. Grout, in his revision of this genus, places all the above with *P. intricata.*

657. **P. filari-acuminata,** C. M. & KINDB.

On trees in woods, Câche Lake, Algonquin Park, Ont., June 9th, 1900. (*Macoun.*)

658. **P. intricata,** Bruch & Schimp.

Common on trees at Baddeck and Margaree, Cape Breton Island, N.S., 1898 ; on old fence rails at Brighton, Ont., 1893 ; at Golden Lake, Ont., 1900. (*Macoun.*) Dr. A. J. Grout, in the Bulletin of Torrey Bota ical Club, Vol. XXIII., pages 223-233, publishes a preliminary Revision of the North American Isotheciaceae. We sent him all our mounted specimens for examination, and the changes made by him on the returned specimens are given below.

Under *Pylaisia polyantha* he places *P. Ontariensis*, as a synonym, while the specimens entered now on another page are placed under *P. intricata.*

P. pseudo-platygyrium and *P. filari-acuminata*, are reduced to one and take the name of *Pylaisiella polyantha pseudo-platygyria.* (Kindb.) *P. Selwynii*, Kindb. becomes a synonym of *P. intricata.*

P. revolutifolia Kindb. is referred to *Entodon repens*, (*Platygyrium repens.* Bruch and Schimp.)

More work is necessary on this genus before our specimens will be satisfactorily arranged.

110. HOMALOTHECIUM, Bruch & Schimp.

662. **H. sericeoides,** C. M. & Kindb.

On rocks, Moose Mountain, Elbow River, Alta., July 1st, 1897. (*Macoun.*)

663. **H. sericeum,** Linn.

On earth by the sea near the Indian Village, Comox, Vancouver Island, June 20th, 1893. (*Macoun.*)

111. ENTODON, C. Muell.

667. **E. Macounii,** C. M. & Kindb.

On an elm log in swampy woods, Rideau Park, Ottawa, Ont., April 28th, 1900 ; on earth near the Hogsback, Rideau River, near Ottawa, May 2nd, 1897. (*Macoun.*)

669. **E. seductrix,** (Hedw.) C. Muell.

On earth in woods, Niagara-on-the-Lake, Ont., June 26th, 1892 ; on old logs, Camlachie, Lambton Co., Ont., June 1901. (*Macoun.*)

1126. **E. Sullivantii,** C. MUELL.; Lesq. & James' Mosses of N. America, 313.

On logs at Edmonton, Ont., Nov. 15th, 1892; also creeping closely on rotten logs at Edmonton, Ont., Oct. 15th, 1892. (*Jas. White.*)

1127. **E. orthocarpus,** (LA PYL.) LINDB.

On an island in the Yukon River, about 10 miles below Fort Selkirk. On ground under heavy spruce forest. This species has before been reported only from Colorado and Newfoundland in North America. (*Williams.*)

112. CLIMACIUM, Web. & Mohr.

672. **C. dendroides,** WEB. & MOHR.

Very abundant on old logs in a swamp at Golden Lake, Renfrew Co., Ont. In very fine fruit Sept. 27th, 1900. (*Macoun.*) Cañon City, Dyea Creek, Alaska; Marsh Lake and Klondike River bottom near its mouth. Not fruiting. (*Williams.*)

Var. **Oregonense,** REN. & CARD.

Shore of Lake Marsh, Yukon, on gravel; sterile. (*Williams.*)

673. **C. Americanum,** BRID.

Roundhouse woods, near Niagara Falls, Ont., May 20th, 1901. (*Macoun.*)

674. **C. Ruthenicum,** (WEINM.) LINDB.

Port Etches, Alaska, Lat. 60° 30', June 18th, 1892. (*J. M. Macoun.*)

113. ORTHOTHECIUM, Bruch & Schimp.

678. **O. chryseum,** BRUCH & SCHIMP.

On earth along Bragg's Creek, Elbow River, Rocky Mountains, July 9th, 1897. (*Macoun.*) Skagway and Lake Bennett. (*Williams.*)

114. PSEUDOLESKEA, Bruch & Schimp.

679. **P. atrovirens,** (DICKS.) BR. EUR.
P. patens, LIMPR.; Ren. & Card., Bot. Gaz. Vol. XXX., p. 22.
P. atrovirens, subsp. *tenella*, Kindb., Bryol. N. Am. & Eur., 50.

Labrador and Newfoundland. (*Waghorne.*) On rocks, Dawson route, west of Lake Superior, July 25th, 1872, referred in Part VI. to *Leskea polycarpa*; on rocks, Mount Benson, near Nanaimo, Vancouver Island, 1887 and 1893. Referred to *P. oligoclada* in Part VI. On rocks at Sicamous, B.C., July 3rd, 1889, referred to *P. falcicuspis* in Part VI. On rocks, Crow's Nest Lake, Rocky Mountains, Aug. 3rd, 1897. (*Macoun.*)

680. **P. oligoclada,** KINDB.

On damp rocks, Mount Benson, near Nanaimo, Vancouver Island, June 8th, 1887 and July 10th, 1893; on rocks at the Illicillewaet Cañon, near Revelstoke, B.C., May 18th, 1890. (*Macoun.*)

681. **P. denudata,** KINDB.; Best, Torr. Bull., Vol, XXIX., p. 229.
Type locality as in Part VI.

Var. **Holzingeri,** BEST. NEW. var.

Cape Chudleigh, Hudson Strait, Aug. 8th, 1884. (*Dr. R. Bell.*)

684. **P. rigescens,** (WILS.) LINDB.
P. stenophylla, Ren. & Card.; Cat. Can. Pl. Part, VI., 181.

Quite common on stems of alder and on stones on damp mountain slopes in Roger's Pass, Selkirk Mountains, B.C., Aug. 5th and July 31st 1890; on rocks, mountains north of Griffin Lake in the Gold Range, B.C., Aug. 9th, 1889. (*Macoun.*)

683. **P. radicosa,** (MITT.) LESQ. & JAMES.

Labrador and White Bay, Newfoundland. (*Waghorne.*) On rocks, Roger's Pass, Selkirk Mountains, B.C., July 29th and Aug. 2nd, 1890; on rocks, mountains, north of Griffin Lake, B.C., Aug. 11th, 1889; on rocks, Yale, B C., May 18th, 1875; on rocks at Quesnel, B.C., May 29th, 1875; on rocks, Moose Mountain, Elbow River, Alta., July 4th, 1897. (*Macoun.*) Lake Lindeman, Yukon. (*Williams.*)

Var. **compacta,** Best. Bull. Torr. Bot. Club, Vol. XXVII., 231.

In intricate tufts or loose mats, dark green to blackish, branches often with yellow-green tips ; stems 2-3 cm. long; branches short, turgid; stem-leaves not rarely straight ; median leaf-cells oval-rhombic to oblong-hexagonal.

On rocks in a brook in Roger's Pass, August 21st, 1885 and July 31st, 1890 ; also on rock three miles below Hector, Rocky Mountains, B.C., August 13th, 1890. (*Macoun.*)

1128. **P. substriata,** Best.; Bull. Torr. Bot. Club., Vol. XXVII., p. 233.

In appressed, subshining tufts, yellowish green to golden-brown; stems prostrate, radiculose 2-4 cm. long, pinnately branched ; branches suberect, simple, scarcely curved; paraphyllia few, multiform; stem leaves erect-spreading, straight, deeply biplicate, oval-oblong, gradually acute or acuminate (acumen shorter than body), ·8-1 mm. long, ·3-4 mm. wide; margins strongly recurved to nearly apex, serrate above ; costa toothed, subpercurrent ; stem-leaves smooth, clear ; basal, oblong-linear in 2 or 3 rows; alar quadrate, rugose, thick-walled, filling the space between folds and margins, extending upwards and becoming oblong ; apical linear; median sublinear .006 mm. wide, 4-6 times as long.

Type specimens collected on rocks three miles below Hector, on the Canadian Pacific Railway, B.C., Aug. 13th, 1890. It was originally numbered 484 and named *P. atrovirens* by Dr. Kindberg.

On rock along the shore of Lake Lindeman, Yukon. (*Williams.*)

We have followed Dr. Best in the arrangement of our specimens of this genus as we believe he has done good and careful work.

1129. **P. pallida,** Best. var. **filescens,** Best.

Head of Lake Bennett, Yukon. (*Williams.*)

115. HETEROCLADIUM, Bruch & Schimp.

687. **H. dimorphum,** Br. Eur.

H. squarrosulum (Voit.) ; Kindb. Bryol. N. Am. & Eur., 46 ; Best, Bull. Torr. Bot. Club, Vol. XXVIII., p. 127.

On rocks at Hector, Rocky Mountain , B.C., Aug. 15th, 1890. Referred to *Pseudoleskea atrovirens* in Part VI. (*Macoun.*)

688. **H. Macounii,** Best, Bull. Torr. Bot. Club, Vol. XXVIII., p. 127.

H. heteropterum, Can. Cat. Pt. VI., p. 182.

Plants small, in dense, spreading tufts, yellowish green to golden brown. Stems without central strand, stoloniform, 3 to 5 cm. long, irregularly branched; stems and branches curved at the tips; larger branches (secondary stems) pinnate or bipinnate, often subfasciculate, ascending-erect; paraphyllia few, ovate or linear-lanceolate, serrate; stem-leaves close, appressed when dry, erect-spreading when moist, subsecund, narrowly costate to the middle, .3 to .4 mm. wide, .5 to .7 mm. long; from a cordate, subclasping base, ovate, gradually to abruptly acuminate, spreading, tips recurved, margins plane, papillate-serrulate; larger branch-leaves ovate-lanceolate, long-acuminate, serrate, more or less secund; cells of the basal-central area of stem-leaves sublinear, .005 to .007 mm. wide, 3 to 5 times long, gradually passing into the quadrate cells of the basal angles and margins and becoming roundish quadrate to rhombic-oblong above, each cell with usually two small papillæ on both surfaces near the ends of its long diameter; apical cells of smaller branch-leaves quadrate, crowned with two papillæ. Dioecious; perichetial bracts whitish, inner long, acuminate, flexuous-spreading, serrate; pedicels smooth, shining, flexuous, about 1·5 cm. long; capsules oblong, gradually tapering to a short neck, horizontal, pachydermous, reddish brown, lightly constricted under the mouth and subpendant when deoperculate; urn .8 mm. wide, 1·5 to 2 mm. long; exothecial cells elliptical-oblong; exostomial teeth yellowish brown, strongly lamellate, confluent into a reddish basal band; endostomial band nearly one half the length of the teeth; segments somewhat open, as long as the teeth; cilia 1 to 2, nodose-appendiculate; annulus broad, of two rows of cells, deciduous; operculum conic, obliquely rostellate; spores .009 to .012; matures in spring.

Type specimen collected on damp rocks above the railway bridge at Goldstream, 10 miles from Victoria, Vancouver Island, June 2nd, 1893. This was named *P. Vancouveriense* by Kindberg. On May 18th, 1887, the same species was collected in the same place and named *P. heteropterum*, Bruch. Fine specimens were collected on Protection Island and Mount Benson, near Nanaimo, July, 1893; also on Mount Arrowsmith, Vancouver Island, July

19th, 1887. (*Macoun.*) Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

690. **H. procurrens,** (MITT.) RAN. & HERVEY.
H. aberrans, Ren. & Card. ; Can. Cat. Pt. VI., 183.

Specimens from Roger's Pass and Revelstoke are correctly named. (*Macoun.*) On rocks at Skagway and Cañon City, Alaska. (*Macoun.*)

689. **H. heteropterioides,** BEST ; Bull. Torr. Bot. Club, Vol. XXVIII., 128.
H. heteropterium, Can. Cat. Pt. VI., p. 182 in part.

Plants quite small, in intricate spreading tufts, dark green. Stems, without central strand, 3-6 cm. long, variously divided and irregularly branched ; larger branches (secondary stems) ascending-erect, pinnate to bipinnate ; branchlets fasciculate, often tufted ; leaves of primary stems erect-spreading, lower sometimes recurved at tips, papillose, .25-.35 mm. wide, .4-.5 mm. long ; from a cordate, subdecurrent base, triangular to ovate-lanceolate, finely pointed, margins plane, papillose-denticulate, costa thin, usually short, rarely narrow and longer, reaching the middle ; leaves of secondary stems appressed when dry, erect-spreading when moist, cordate-triangular, acute to acuminate, margins papillose-serrulate ; ultimate branch-leaves ovate, acute to narrowly acuminate, cells of the basal-central area of the stem leaves, not so clearly differentiated as in the preceding species, oblong to sublinear about ·006 mm. wide, 2-4 times as long, those of the basal margins quadrate, passing into oval-oblong above, each cell with 2-5 small bead-like, irregularly distributed papillæ on both surfaces; apical cells of ultimate branch-leaves quadrate to oblong, crowned with 2-4 papillæ. Dioecious : perichetial bracts whitish, flexuose-spreading, inner long and narrowly acuminate, margins denticulate, pedicels smooth, flexuose-curved, about 1.5 cm. long ; capsule oval, horizontal, short-necked, pachydermous, contracted under the mouth when deoperculate ; urn 1.5 mm. long, .7 mm. wide ; exothecial cells thick-walled, oval to oblong ; annulus broad, of 2-3 rows of large cells, deciduous; exostomial teeth yellowish, strongly lamellate, confluent at the base ; endostomial band about one-half the length of the teeth ; segments slightly

open'; cilia 1-2, nodose ; operculum conic-rostrate, straight or o lique, nearly as long as capsule ; spores smooth, .010-.012 mm.; matures in summer ; grows on rocks and stones in damp places. Type locality, Washington ; on rocks, Forward Inlet, Gulf of Georgia, B.C., 1885. (*Dr. G. M. Dawson.*) On rocks at Hastings, B.C., April 6th, 1889. (*Macoun.*)

Var. **filescens,** BEST. Bull. Torr. Bot. Club, Vol. XXVIII. 129.

H. heteropterum, Can. Cat. Pt. VI. 182 in part.

In widely spreading tufts, dark green passing into yellowish green. Stems prostrate, 8-10 cm. long, or longer, sparingly branched ; stems and branches filiform ; leaves smaller ; papillæ as in type ; sterile.

On rocks at Hastings, B.C., April 13th, 1889 ; on rocks Nanaimo River, Vancouver Island, April 27th, 1887 ; also on rocks at Goldstream, near Victoria, Vancouver Island, June 2nd, 1893. (*Macoun.*)

PSEUDOLESKEELLA, Kindb.

1130. **P. occidentalis,** (SULLIV.) Kindb., Bryol. N. Am. & Eur. p. 48.

Hypnum occidentalis, S. & L. Icon. Musc. Suppl. 105.

On rocks in a ravine at Goldstream, Vancouver Island, June 2nd, 1893 ; along Nanaimo River, Vancouver Island, April 27th, 1887; on rocks, Mount Finlayson, near Victoria, Vancouver Island, May 31st, 1887 ; on rocks by the Colquitz River, near Victoria, Vancouver Island, June 1st, 1893. (*Macoun.*) A part of the above specimens were named *H. Vancouveriense* by Kindberg and all of them *Hypnum occidentalis*, Sulliv., by Dr. Best in the paper cited on the preceding pages. We have followed Dr. Best in the disposition of our specimens of the genera *Leskea*, *Pseudoleskea*, *Heterocladium*, *Thuidium and Claopodium.*

116. THUIDIUM, Schimp.

695. **T. gracile,** BRUCH & SCHIMP.

T. microphyllum, Sw. ; Best, Bull. Torr. Bot. Club, Vol. XXIII., p. 87.

On stones at Credit Forks, Ont. (*Jas. White.*)

1131. **T. Virginianum,** (Brid.) Lindb.; Best, Bull. Torr. Bot. Club, Vol. XXIII., p. 87.

T. gracile, Br. & Sch. var. *Lancastriense*, Sulliv. & Lesq. Cat. Can. Cat. Pt. VI., 184.

Woods west of Hull, Que., April, 1902. (*Macoun.*)

697. **T. recognitum,** (Hedw.) Lindb.

Yukon River above Fort Selkirk and common about Dawson, Yukon. (*Williams.*)

1132. **T. pseudo-gracile,** Kindb., Bryol. N. Am & Eur. 56.

Differs from *T. Virginianum :* Leaves of stem broader, from a very broad base, more abruptly narrowed to the often falcate and generally not long acumen, entire, nearly smooth; branch-leaves entire or faintly denticulate. Capsules unknown. Differs also from *T. scitum :* Leaves larger and broader ; costa percurrent or excurrent. Stem-leaves shorter and more broadly revolute ; branch-leaves ovate-oblong, acuminate or acute.

On old logs in woods near Leamington, Ont., Sept. 19th, 1890. (*Macoun.*)

698. **T. delicatulum,** (Linn.) Mitt., var. **repens,** Kindb., Ott. Nat., Vol. XIV., 79.

Stem creeping and rooting.

On roots of trees at Woodstock, N.B., July 3rd, 1899. (*Macoun.*)

699. **T. abietinum,** Bruch & Schimp.

On dry limestone rocks, Queenston Heights, Ont., May, 1901. (*Macoun.*) Tagish Custom House and common about Dawson, Yukon, on earth and rock. (*Williams.*)

700. **T. Blandowii,** (Web. & Mohr.) Bruch & Schimp.

At the head of Lake Bennett, also near the mouth of Bonanza Creek, Yukon ; in fine fruit, July 9th, 1899. (*Williams.*)

701. **T Whippleanum,** (Sulliv.) Kindb.

Claopodium Whippleanum, (Sulliv.) Best, Bull. Torr. Bot., Club, Vol. XXIV., p. 428.

On rocks, Pier's farm, near Victoria, Vancouver Island, May 9th, 1893 ; on earth by a brook, Point Holmes, near Comox, V.I., July 3rd, 1893. (*Macoun.*)

1133. **T. Philiberti,** LIMPRICHT. 1895.

On the bases of trees in woods. Overlooked but doubtless not rare. In woods, Big Intervale, Margaree, Cape Breton Island, N.S., July 22nd, 1898; also in a ravine at Woodstock, N.B., July 4th, 1899. On earth, Pelee Point, Essex Co., Ont., June 4th, 1901. On the bases of trees, Cascades, Gatineau River, Que., June, 1900. (*Macoun.*) In woods, New Brunswick. (*J. Moser.*) Klondike River bottom near its mouth, Yukon. Sterile. (*Williams.*)

1134. **T. leuconeuron,** SULLIV. & LESQ.
Claopodium leuconeuron, (S. & L.) Ren. & Card.

On boulders, Sooke Lake Road, near Goldstream, Vancouver Island, June 2nd, 1893. (*Macoun.*)

1135. **T. Bolanderi,** (BEST); Bull. Torr. Bot. Club, Vol. XXIV., p. 431.

On rocks at Sproat, Columbia River, B.C., June 27th, 1890; on rocks, Revelstoke, B.C., May 5th, 1890; on rocks, Sicamous, B.C., July 16th, 1889; on rocks at Yale, B.C., Dec. 9th, 1872; on rocks, Cedar Hill, Victoria, Vancouver Island, April 21st, 1887. (*Macoun.*) On rocks, Kadiak Island, Alaska, Sept. 22nd, 1891. (*J. M. Macoun.*) On rocks, Malespina Inlet, B.C., July, 1885. (*Dr. G. M. Dawson.*) On rocks, Griffin Lake, B.C., Aug. 11th. 1889. All the above specimens have been taken out of *T. crispifolium.*

1136. **T. pseud-abietinum,** KINDB. Note on Canad. Bryol. 1893.

Leaves orange at insertion; middle cells oval-oblong. Stem-leaves ovate, short-acuminate faintly denticulate above. Branch-leaves ovate-oval, sub-obtuse more distinctly denticulate, very opaque and mamillose or papillose on both sides. Stem brown-tomentose; branches short and distant. Lid of capsule not seen. Labrador. (*Waghorne.*) On earth in a swamp at Britannia, 6 miles west of Ottawa, Ont., Sept. 11th, 1890. Referred in Part VI., p. 186 to *T. Blandowii.* (*Macoun.*)

1137. **T. pellucinerve,** MITT.
Claopodium, pellucinerve, (Mitt.) Best.

Collected at Cañon City, Dyea Creek, Alaska. (*Williams.*)

ELODIUM, Sulliv.

1138. **E. paludosum,** Sulliv.; Lesq. & James Mosses of N. Am p. 329.

On hummocks in swamps at Edmonton, Ont., Oct. 1892 and Aug., 1893. (*Jas. White.*) Queenston and " roundhouse woods," near Niagara Falls, Ont., 1901. (*Macoun.*)

118. CAMPOTHECIUM, Schimp.

705. **C. lutescens,** Bruch & Schimp.

Sheep Creek, near Juneau, Alaska. (*Miss G. Cooley.*) Sheep Camp, Dyea Creek, Alaska ; on cotton-wood. (*Williams.*)

1139. **C. pinnatifidum,** Sulliv. & Lesq.; Lesq. & James Mosses of N. Am., p. 333.

On rotten logs, Cedar Hill, near Victoria, Vancouver Island, April 16th, 1887. Mixed with *Scleropodium caespitosum.* Determined by Dr. A. J. Grout. (*Macoun.*)

709. **C. Nuttallii,** Bruch & Schimp.

Skagway, Alaska. (*Williams.*

712. **C. nitens,** (Schreb.) Schimp.

In a bog at Galt, Ont., June, 28th, 1901. (*Macoun.*) Lake Lindeman, sterile ; mouth of Little Salmon River in fruit ; at Dawson, Yukon, common and fruiting abundantly. Capsules in fine condition, June 18th, 1899. (*Williams.*)

1140. **C. arenarium,** Lesq.; Lesq. & James Mosses of N.Am. 333.

On the sand spit at Comox, Vancouver Island, July 3rd, 1893. (*Macoun.*)

119. BRACTRYTHECIUM, Schimp.

714. **B. lætum,** Brid.

On old logs and rocks Câche Lake, Algonquin Park, Ont., 1900; on earth at Carleton Place, Ont., May, 1900. (*Macoun.*) Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

715. **B. digastrum,** C. M. & KINDB.

On rocks by the Gatineau River, at the Cascades, Que., June 23rd, 1900; on stones in woods, Big Intervale, Margaree, Cape Breton, Island, N.S., July 15th, 1898. (*Macoun.*)

1141. **B. subglaciale,** (KINDB.) N. SP.

On rocks at Fort Chimo, Ungava, Sept. 9th, 1896. (*A. P. Low.*)

1142. **B. cyrtophyllum,** KINDB., OTT. NAT., Vol. XIV. 63.
B. acuminatum var. *cyrtophyllum*, Cat. Can. Pt. VI., 191.

On elm trunks in woods at Carleton Place, Ont., May 12th, 1900. (*Macoun.*)

718. **B. salebrosum,** BRUCH & SCHIMP.

On trees and boulders in woods at Baddeck and Margaree, Cape Breton Island, N.S., July, 1898; on earth Câche Lake, Algonquin Park, Ont., 1900; on stones in woods, Foster's Flats and Queenston Heights, Ont., May, 1901. (*Macoun.*) Lake Lindeman and Dawson, Yukon. (*Williams.*)

Var. **densum,** BRUCH & SCHIMP.

North of Little Salmon River, Yukon. I refer specimens here, with rather narrower leaves more closely placed on stems and branches than the preceding. (*Williams.*)

Var. **Waghornei,** REN. & CARD., Bot. Gaz., Vol. XIX, p. 238.

A pecular form, distinguishable from the type by the tufts being very dense, the stems erect, turgid, not radiculose, the leaves more crowded, imbricate, and the lid mamillate. Differs from the allied *B. mamilligerum*, Kindb., in the leaves imbricate, not patulous when dry, and the stems not radiculose. Much smaller than *B. turgidum*, Hartm. Monoecious.

Battle Harbour, Labrador. 1891. (*Waghorne.*)

719. **B. glareosum,** BRUCH.

Dr. A. J. Grout believes the specimens collected at Revelstoke and mentioned in Part VI., p. 192, to be *B. flexicaule*, Ren. & Card.

721 **B. lævisetum,** KINDB.

Dr. A. J. Grout believes the type specimen of this species to *B. salebrosum* (Hoffm.) Batsch.

On stones in a ravine at Woodstock, New Brunswick, July, 1899; on the bases of trees, Blueberry Point, Aylmer, Que., April 17th, 1900. (*Macoun.*)

723. **B. albicans,** BRUCH & SCHIMP.

On earth in woods, Leamy's Lake, Hull, Que., Nov. 9th, 1896. (*Macoun.*) On rock at Skagway, Alaska; sterile. (*Williams.*)

724. **B. harpidioides,** C. M. & KINDB.

On earth in woods, Beechwood Cemetery, Ottawa, Ont., May 16th, 1900. (*Macoun.*)

1143. **B Idahense,** REN. & CARD.

On earth and rock at Dawson, Yukon. (*Williams.*)

733. **B. velutinum,** BRUCH & SCHIMP.

On earth at the bases of trees, Foster's Flats, Niagara River, Ont., May 16th, 1901. (*Macoun.*)

734. **B. Starkei,** BRUCH & SCHIMP.

On earth in woods, Câche Lake, Algonquin Park, Ont., June, 1900. (*Macoun.*) Lake Lindeman, Yukon. (*Williams.*)

735. **B. œdipodium,** MITT.

On earth in woods, Câche Lake, Algonquin Park, Ont., June, 1900. (*Macoun.*)

737. **B. reflexum,** (STARK.) BRUCH & SCHIMP.
Eurhynchium reflexum, STARK.; Kindb., Bryol. N. Am. & Eur. 101.

On boulders, Meech's Lake, Chelsea, Que., Sept. 23rd, 1893. On stones in a brook, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898. (*Macoun.*) On a knoll in woods at Edmonton, Ont., 1892. (*Jas. White.*) Lake Lindeman, Yukon. (*Williams.*)

Var. **Demetrii,** (REN. & CARD.) Bot. Gaz. Vol. XIX, p. 239.

Differs from the genuine form in the stronger habit, the thicker erect branches, and the broader softer leaves.

Squaw Island, Labrador, 1891. (*Waghorne.*)

738. **B. rutabulum,** BRUCH & SCHIMP.

On earth, Foster's Flats, Niagara River, Ont., May, 1901. (*Macoun.*)

739. **B. spurio-rutabulum,** C. M. & KINDB.

Dr. A. J. Grout reduces this species and No. 742 to *B. asperrimum*, Mitt. Kindberg does not recognize this species in my collections. On old logs in woods near Victoria and at Comox, Vancouver Island, 1893. (*Macoun.*)

748. **B. campestre,** BRUCH & SCHIMP.

On earth in woods at Câche Lake, Algonquin, Park, Ont., June 1900. (*Macoun.*)

749. **B. rivulare,** BRUCH & SCHIMP.

Port Etches, Alaska, Lat. 60° 30′, 1892. (*J. M. Macoun.*) On stones in spring brooks, Big Intervale, Margaree, Cape Breton, Island, N.S., July, 1898. (*Macoun.*) St. Paul Island, Behring Sea. (*Dr. Merriam.*)

751. **B. populeum,** BRUCH & SCHIMP.

On rocks and stones in damp woods, Margaree, Cape Breton Island, N.S., July, 1898; on boulders in woods, Câche Lake, Algonquin Park, Ont., June, 1900. (*Macoun.*)

752. **B. plumosum,** BRUCH & SCHIMP.

On rocks, Aroostook Falls, N.B., 1899; on rocks in brooks and damp woods, Margaree, and Half-Way House, Cape Breton Island, 1898; abundant on rocks, Meech's Lake, Chelsea, Que., Sept., 1893; on stones in woods, Câche Lake, Algonquin Park, Ont., 1900. (*Macoun.*) Chilliwack Valley, B.C., 1901. (*J. M. Macoun*)

1144. **B. cavernosum,** KINDB., Revue BRYOL., 1895.

Differs from *B. rutabuliforme :* Leaves more concave, recurved on both sides to acumen ; alar and lower basal cells small, green and well-defined. Lid of capsule longer pointed or rostellate.

On rocks near high-water mark, Spanish Mills, and on moist rocks, Credit Forks, Ont., 1892-93. (*Jas. White.*)

1145. **B. Hillebrandi,** LESQ.; Lesq. & James, Mosses of N. America, 340.

On old logs in woods, Carleton Place, Ont., May 12th, 1900. (*Macoun.*)

1146. **B. biventrosum,** MUELL.; Lesq. & James, Mosses of N. America, 338.

On old logs in woods, Carleton Place, Ont., May 12th 1900. (*Macoun.*)

1147. **B. calicareum,** KINDB., Revue Bryol., 1895.

Leaves crowded, long-acuminate, filiform-pointed, more or less recurved, incurved-falcate when dry, patent when moist; angular cells short, special alar cells few, hyaline and much larger, the others linear. Stem-leaves with a broad base; costa short, generally vanishing near the middle. Branch-leaves narrow ; costa nearly reaching the acumen. Capsule small, arcuate; cilia not appendiculate; lid apiculate; pedicel smooth about 1 cm. long. Tufts dense, radiculose, green, faintly glossy. Stem irregularly divided; branches not compressed. Habit of *B. intricatum.*

Abundant on flat limestone rocks in Rockcliffe Park, Ottawa, Ont., Oct., 1892, May, 1899, and June, 1900. (*Macoun.*)

1148. **B. intricatum,** HEDW.; KINDB., Bryol. N. Am. & Eur. 118.

On damp rocks, Meech's Lake, Chelsea, Que., Sept. 23rd, 1893. New to America. (*Macoun.*)

1149. **B. subintricatum,** KINDB., Revue Bryol., 1895.

Leaves narrowly ovate-oblong, or ovate-lanceolate nearly uniform (those of the branches not much narrower), nearly crowded (at least those of the stem), decurrent, not falcate when dry; alar cells few, the others linear; costa vanishing above the middle.

Capsule arcuate; pedicel very rough. Stem subpinnate. Differs from *B. velutinum* and *B. intricatum :* Leaves faintly denticulate filiform-pointed ; alar cells often dilated. Perichetial leaves nearly entire with a long filiform deflexed point. Capsule oblong-cylindric, arcuate. Tufts loose, sparingly radiculose dusky green. Branches faintly compressed.

On trunks, near their bases, Sea's farm, near Victoria, Vancouver Island, 1893. (*Macoun.*)

1150. **B. erythrorrhizon,** Bruch & Schimp.

On earth, common at Dawson, Yukon. (*Williams.*) Canaan Forks, Queen's Co., N.B. (*J. Moser.*)

This specimen was referred to *Eurhynchium hians* in Part VI. 206.

1151. **B. cirrosum,** Schwaegr.
Cirriphyllum cirrosum (Schwaegr.) Grout.

In thick mats on rocks by a stream. Collected in rather old fruit, August 27th, 1899, at Skagway, Alaska. (*Williams.*)

1152. **B. petrophyllum,** R. S. Williams, Bull. of New York Bot. Gar., Vol. II., p. 136, 1901.

In low dense tufts or sometimes in thin mats with long creeping stems and short subpinnate branches. Stem leaves 1.5 mm. long by .04 mm. wide, narrowly ovate-lanceolate, about one-half costate, serrulate all round, more or less decurrent and margin reflexed near base. not very concave, and scarcely or not plicate. Median leaf-cells linear, flexuous up to ·065 mm. long, and ·005 mm. wide. Alar cells short and broad, not forming a distinct cluster. Branch leaves very similar to stem leaves but mostly a a little smaller with longer costa ending in spine on back and adjacent cells, sometimes papillose by the projecting upper ends. Inner perichetial leaves pale ecostate, gradually narrowed to a slender, flexuous, serrulate point, with rarely 1 or 2 coarse teeth at its base. Capsule nodding, curved with lid about 2·5 mm. long and 1 mm. broad. Lid conical its height about equal to basal diameter. Annulus of two rows of cells. Teeth of peristome hyaline bordered, papillose above, outer plates striate, inner lamellae about 30, segments without rounded perforations, more or less split along the keel with mostly 2 appendiculate cilia

between. Seta rough throughout, up to 1 c.m. high. Smooth spores up to ·011 mm.

On rock at Dawson, Yukon. In good fruit, June 24th, 1898. This species is evidently nearest to *suberythrorrhizon* but differs in the rough pedicel, leaves narrower, less serrate and plicate, and cilia appendiculate. (*Williams.*)

120. SCLEROPODIUM, Schimp.

754. **S. cæspitosum,** (Wils.) Br. & Sch.

On rocks, Drew's Harbour, Vancouver Island, 1885. (*Dr. G. M. Dawson.*) On rocks, Lake Athabasca, Sept., 1875. (*Macoun.*)

757. **S. illecebrum,** (Linn.) Br. & Sch.

On rocks in Pier's woods, near Victoria, Vancouver Island, May 8th, 1893; on wet rocks, Agassiz, B.C., May 8th, 1889; the latter specimen was referred in Part VI., p. 202 to *S. obtusifolium* by Kindberg. (*Macoun.*)

1153. **S. colpophyllum,** (Sulliv.) Grout.

Cedar Hill, near Victoria and on the bases of trees near Esquimalt, Vancouver Island, 1893; also a doubtful specimen (named by Kindberg) at Otter Lake Creek, Algonquin Park, Ont., July 19th, 1900. (*Macoun.*)

Var. **attenuatum,** Grout.

Stoloniferous, much more slender, with more distant, loosely spreading leaves; leaves much narrower with a longer and more slender acumination; branch leaves varying from 1·7 x 0·54 mm. on the longer branches to 1 x 0·2 on the smaller.

Type from perpendicular rocks at Goldstream, near Victoria, Vancouver Island, June 2nd, 1893. (*Macoun.*) I have followed Dr. A. J. Grout in the arrangement of the specimens of this genus. See his revision of the North America species of *Scleropodium* in the Contributions of the Department of Botany of Columbia University, No. 165.

121. ISOTHECIUM, Brid.

1154. **I. brachycladon,** Kindb., Bryol. N. Am. & Eur. 35.

Differs from *I. aplocladum:* Leaves smaller; those of the stem subovate, nearly entire, with very short or indistinct costa; branch-

leaves sometimes short-acuminate. Stem creeping, irregularly divided; branches distant, very short, slightly curved not julaceous. Tufts bright green. Capsules unknown. Habit of *I. striatum.*

Under damp rocks, Sea's Farm, near Victoria, Vancouver Island, May 6th, 1893. (*Macoun.*)

Dr. A. J. Grout writes on this specimen "Not *aplocladon.* Probably *myurellum.*"

1155. **I. hylocomioides,** KINDB., BRYOL. N. Am. & Eur. 35.

Differs from *I. Breweri.* Leaves shorter, subovate, generally subobtuse, more sharply serrate above to below the middle; apical cells oval-oblong, middle and lower linear, alar disposed on a short space. Perichetial leaves minutely denticulate. Capsule cylindric-oblong sometimes curved; teeth pale yellow; cilia short; lid not seen. Tufts loose, green or brown-green. Stem bipinnate; branches numerous not julaceous, often with short flagellæ.

On rocks in the ravine at Goldstream, near Victoria, Vancouver Island, June 2nd, 1893; on damp rocks, Victoria Arm, Victoria, Vancouver Island, May 11th, 1893. (*Macoun.*)

Dr. A. J. Grout refers the above specimens to *I. stoloniferum.*

1156. **I. thamnioides,** KINDB., BRYOL. N. Am. & Eur. 36.

Stem-leaves denticulate below, serrate or twice serrulate above; upper cells rhombic or rhomboidal. Branch-leaves serrate nearly all around; upper cells lanceolate-linear, middle and lower sublinear, alar disposed on a short space. Perichetial leaves serrate. Capsule cylindric, inclined or slightly curved; lid short-acuminate; teeth yellow; cilia short appendiculate. Tufts loose, glossy green. Branches long-attenuate nearly crowded not julaceous.

On rocks in the ravine at Goldstream, Vancouver Island, June 2nd, 1893. (*Macoun.*)

1157. **I. obtusatulum,** KINDB., REVUE BRYOL.; 1895.

Stem-leaves broad-ovate, short, acuminate, acute, recurved below, serrate above; branch-leaves smaller, suboval, obtusate often obtuse; upper (sometimes also the middle) cells oval or broad-oblong, middle narrowly oblong or sublanceolate; costa reaching to ¾ or shorter. Capsule oblong; teeth yellowish; cilia nodose,

shorter ; lid muticous, acute. Stem pinnate ; branches generally distant, often flagelliferous. Tufts dark green.

On rocks, Parson's Mountain, near Victoria, Vancouver Island, May 17th, 1893. (*Macoun.*)

The whole genus needs revision as altogether too many species have been made.

122. EURHYNCHIUM, Schimp.

768. **E. strigosum,** (Hoffm.) Br. & Sch.

On rotten logs, Edmonton, Ont., 1892. (*Jas. White.*) On earth, Jumping Pound Creek, Alta., 1897; on hillsides, Old Wives' Creek, Assa., 1895 ; on earth in a ravine at Woodstock, New Brunswick, 1899 ; on earth and logs, Algonquin Park, Ont., 1900. (*Macoun.*) Common at Dawson, Yukon. (*Williams.*)

Subsp. **præcox,** Hedw.; Kindb., Bryol. N. Am. & Eur., 104.

On rocks, Deer Park, Lower Arrow Lake, Columbia River, B.C., June 4th, 1890. (*Macoun.*)

776. **E. gramincolor,** Brid.

E. Sullivantii, (Spruce) ; Can. Cat., Pt. VI., 206,

On limestone rocks, quite common at Foster's Flats, Niagara River, Ont., 1901. (*Macoun.*)

777. **E. hians,** (Hedw.) Lesq. & James.

On earth in woods at Southampton, Ont., August 20th, 1901. (*Macoun.*)

778. **E. Stokesii,** (Turn.) Bruch & Schimp.

Specimens from old logs and damp rocks at Hastings, B.C., April 6th and 8th, 1889, are placed here by Dr. A. G. Grout. They were placed with *E. hians* by Dr. Kindberg in Part VI., p. 206. (*Macoun.*)

Subsp. **pseudo-speciosum,** Kindb. Bryol. N. Am. & Eur., 95.

Leaves squarrose ; costa vanishing below the acumen. Stem creeping. Capsules unknown.

On earth under a log, Sea's farm, Victoria, Vancouver Island, May 6th, 1893. (*Macoun.*)

780. **E. semiasperum,** C. M. & KINDB.

The specimen on which this species is based is referred to *Brachythecium plumosum* by Dr. A. J. Grout.

1158. **E. subscabridum,** KINDB., Bryol. N. Am. & Eur., 93.

Differs from *E. Sullivantii:* Stem subjulaceous; branches attenuate, longish, nearly crowded. Leaves shorter, more concave and longer decurrent; alar cells more numerous. Stem-leaves filiform-pointed; branch leaves ovate-oblong, long-acuminate. Tufts pale green. Sometimes pseudo-monoecious. Capsules unknown.

Newfoundland. (*Waghorne.*) On limestone rocks at Ottawa, Ont. We have no specimens. (*Macoun.*)

1159. **E. pseudo-velutinoides,** KINDB., Revue Bryol., 1895.

Leaves subulate-acuminate filiform-pointed, not or slightly, striate, faintly reflexed near the base; cells sublinear; costa short. Stem-leaves entire subovate or ovate-oblong; costa scarcely reaching to the middle. Branch-leaves ovate-lanceolate denticulate all around; costa reaching somewhat above the middle. Perichetial leaves with very long filiform point. Capsules not seen; pedicel rough. Tufts loose, green. Stem not creeping.

On earth, Sea's farm, near Victoria, Vancouver Island, May, 1893. (*Macoun.*)

1160. **E. scabridum,** LINDB.; Kindb., Bryol. N. Am. & Eur., 94.

On earth in woods, Otter Slide Creek, Algonquin Park, Ont., July 19th, 1900. (*Macoun.*)

1161. **E. subcæspitosum,** KINDB., Revue Bryol., 1895.

Differs from *E. illecebrum* and *cæspitosum*; leaves narrower, less crowded and not densely appressed; those of the stem ovate-oblong often filiform-pointed; cells generally linear except the dilated hyaline alar and lowest basal. Branch-leaves denticulate only in upper quarter. Tufts yellowish green, faintly glossy. Capsules unknown.

On wet rocks, Goldstream, near Victoria, Vancouver Island, June 2nd, 1893. (*Macoun.*)

Dr. A. J. Grout refers this species to *Brachythecium asperrimum* mixed with what is probably a *Scleropodium.*

1162. **E. Macounii,** KINDB., Revue Bryol., 1895.

Stem-leaves ovate-oblong, long-acuminate, often filiform-pointed, denticulate at least at the acumen. Branch-leaves sub-ovate-lanceolate, obtusate, denticulate below; upper cells rhombic, alar hyaline, subquadrate, the others sublinear-lanceolate; costa stout, vanishing above the middle. Perichetial leaves long-acuminate, filiform-pointed, denticulate above. Capsule narrow-cylindric, suberect, nearly straight; lid rostellate. Tufts golden, glossy or green. Stem subpinnate; branches acute.

On rocks, Mount Finlayson. near Goldstream, Vancouver Island, 1887. (*Macoun.*)

1163. **E. glaciale.** BR. EUR.

Greenland. (*Berggern.*) On trees in a swamp at Big Intervale, Margaree, Cape Breton Island, N.S., July 20th, 1898. (*Macoun.*)

1164. **E. Labradoricum,** KINDB., Bryol. N. Am. & Eur. 101.

Differs from *E. glaciale:* Leaves larger, somewhat glossy, not appressed when dry; cells sublinear except the large not numerous alar ones; costa vanishing near the middle. Stem-leaves generally entire; branch-leaves long-acuminate minutely denticulate above. Perichetial leaves patent. Capsule curved; pedicel quite smooth, 3-4 cm. long; lid acute; peristome not seen.

Fort Chimo, Ungava Bay, Labrador, Sept. 9th, 1896. (*A. P. Low.*)

1165. **E. acutifolium,** KINDB., Revue Bryol., 1895.

Differs from *E. strigosum:* Leaves long-distant, long-decurrent, with long subulate acumen, spreading also when dry; branches more distant; pedicel of capsule longer; monoecious.

On wet logs near Victoria, Vancouver Island, May 25th, 1893 (*Macoun.*)

123. RAPHIDOSTEGIUM, Lesq. & James.

732. **R. recurvans,** (Schw.) Lesq. & James.

On old logs at Woodstock, N.B., 1899; on earth, on old logs, in a cedar swamp at Sherkstone, near Port Colborne, Ont., 1901. (*Macoun.*)

737. **R. Rœllii,** Ren. & Card.

On rocks in a ravine, Big Intervale, Margaree, Cape Breton Island, N.S., July 16th, 1898. (*Macoun.*)

1166. **R. laxepatulum,** Lesq. & James, Mosses of N. Am. 358.

On old logs, Big Intervale, Margaree, Cape Breton Island, N.S., July 20th, 1898; on roots of trees, Dawson route, July, 1872; in thick mats on the bases of trees at Belleville, Ont., 1868; also on logs, Ste. Anne des Monts River, Gaspé Co., Que., Aug., 1882. The last three specimens were placed under *R. recurvans* in Part VI., p. 308. Mrs. E. G. Britton discovered these and other inaccuracies in the determination of species in this genus. (*Macoun.*)

1167. **R. Whitei,** Kindb., Bryol. N. Am. & Eur. 101.

Leaves faintly or not recurved, generally entire below the acumen, with serrate filiform or subulate point; alar cells hyaline. Perichetial leaves dentate at the long acumen. Capsule suboval, curved or oblique; teeth pale; segments entire, beak not long; pedicel short. Stem pale or red. Tufts green. Monoecious.

On old logs at Edmonton, Ont., 1892. (*Jas. White.*) On old logs in woods, Big Intervale, Cape Breton Island, N.S,, 1898; also on old logs, Algonquin Park Ont., 1900. (*Macoun.*)

124. RHYCHOSTEGIUM, Schimp.

792. **R. rusciforme,** (Weis.) Schimp.

On stones in brooks, Big Intervale, Margaree, Cape Breton Island, N.S., 1898; on stones, Aroostook Falls, N.B., Sept. 1899. (*Macoun.*)

791. **R. serrulatum,** (Hedw.) Lesq. & James, subsp. **eriense,** Kindb., Bryol. N. Am. &. Eur. 63.

Leaves subovate nearly crowded, shorter and less distant than the species; alar cells more distinct. Capsule smaller; pedicel short.

On earth at Leamington, Essex Co., Ont., Sept., 21st, 1890. Referred to *R, serrulatum* in Part VI., p. 210. (*Macoun.*)

Subsp. **hispidifolium,** KINDB., BRYOL. N. Am. & Eur. 68

Branches longer. Leaves very long, ovate-lanceolate, long-acuminate sharply serrate. Capsules and flowers unknown.

On rocks at Craigflower Road, Victoria, Vancouver Island, May 30th, 1893; on old logs, Hastings, B.C., April, 1889. (*Macoun.*)

1168. **R. subintegrifolium,** KINDB., BRYOL. N. Am. & Eur. 68.

Leaves decurrent chlorophyllose ovate-oblong, short-pointed faintly striate; alar cells somewhat numerous, the others sub-linear; costa mostly thin generally reaching to the acumen, sometimes thicker, shorter and forked. Capsule subobovate or arcuate; pedicel smooth; lid and male flowers not seen. Habit of *R. serrulatum.*

On logs and earth, Revelstoke, B.C., May 5th, 1890; on earthy banks by the sea at Comox, Vancouver Island, June 20th, 1893. (*Macoun.*)

1169. **R. Revelstokense,** KINDB., BRYOL. N. Am. & Eur. 67.

Leaves ovate-lanceolate, long-subulate, denticulate, plicate and pellucid, sometimes short-decurrent; cells lanceolate except the alar; costa somewhat thick, vanishing above the middle or shorter. Capsule arcuate; lid rostellate; pedicel short, smooth. Stem creeping subpinnate or irregularly divided. Tufts pale or light green. Male flowers not found.

Newfoundland. (*Waghorne.*) On old logs at Revelstoke, B.C., May 5th, 1890. (*Type*) On earthy banks, Comox, Vancouver Island, June 20th, 1893. (Dr. A. J. Grout makes this specimen *Brachythecium lampochryseum.* (*Macoun.*)

1170. **R. pseudo-serrulatum,** KINDB., BRYOL. N. Am. & Eur. 67.

Leaves ovate or ovate-oblong, minutely denticulate, striate and chlorophyllose, not or indistinctly decurrent; cells lanceolate, the lower shorter and more dilated; costa thin, vanishing above the middle. Stem-leaves with a short-acuminate or filiform-point; branch-leaves with a short, subulate, sometimes twisted point.

Capsule arcuate ; lid apiculate ; pedicel rough, very long. Stem glossy radiculose at the base. Monoecious. Habit of *R. serrulatum.*

Harbour Deep, Seal Cove and Western Cove, Newfoundland, Oct., 1891. (*Waghorne.*) Canaan Forks, N.B., Oct., 1891. (*Moser.*) On earth in woods at Ottawa, Ont., Oct., 12th, 1889. Neither Mrs. Britton nor Dr. Grout accept this species as they say the specimens referred to it are not all the same thing. (*Macoun.*)

125. THAMNIUM, Schimp.

794. **T. neckeroides,** Bruch & Schimp.
Porotrichum neckeroides, (Schwaegr.) Willisms.

Canon City, Dyea Creek, Alaska. (*Williams.*)

126. PLAGIOTHECIUM, Schimp.

800. **P. trichophorum,** (Spruce) Lesq. & James.
P. piliferum, Swartz ; Kindb., Bryol. N. Am. & Eur., 71.

Coast of Queen Charlotte Islands, 1898. (*Dr. C. F. Newcombe.*) Cañon City, Skagway and Lake Lindeman. (*Williams.*)

801. **P. pulchellum,** (Dicks.) Bruch & Schimp.

Above the basin, Juneau, Alaska. (*Miss G. Cooley.*) Common on earth and rock at Lake Marsh and Dawson, Yukon. (*Williams.*) Chilliwack Valley, B.C., 1901 ; on dead moss, St. Paul Island, Behring Sea, 1892. (*J. M. Macoun.*)

807. **P. Muehlenbeckii,** Bruch & Schimp.
Campylium striatellum, Kindb., Bryol. N. Am. & Eur., 119.

Port Etches, Alaska, Lat. 60° 30′, Aug., 1892. (*J. M. Macoun.*) On rocks and damp earth, Big Intervale, and Half Way Brook, Cape Breton Island, N.S., Aug., 1898 ; on old logs at Foster's Flats, Niagara River, Ont., 1901. (*Macoun.*)

808. **P. denticulatum,** (Linn.) Bruch & Schimp.

On earth and rocks, very common, in Algonquin Park, Ont. ; also at Niagara Falls and Camlachie, Ont., 1901. A very abundant species. (*Macoun.*) Head of Lake Bennett and Dawson, Yukon. (*Williams.*)

810. **P. Sullivantiæ,** SCHIMP.

P. Roesei, Hampe ; Kindb., Bryol. N. Am. & Eur., 70.

On hummocks in swamps, Edmonton, Ont., Oct., 1892. (*Jas. White.*) On earth on roots, Meech's Lake, near Chelsea, Que., Sept. 23rd, 1893. (*Macoun.*)

811. **P. membranosum,** KINDB.

Rhyncostegium membranosum, Kindb., Bryol. N. Am. & Eur., 67.

On old logs, at Edmonton, Ont., 1892. (*Jas. White.*) On old logs, Jumping Pound Creek, Rocky Mountains, Alta., June 14th, 1897. Mrs. E. G. Britton doubts the correctness of the identification of the latter specimen. (*Macoun.*)

812. **P. brevipungens,** KINDB.

Old logs, Johnstone's Lake, North Wakefield, Que., June 2nd, 1898 ; also on old logs, Carleton Place, Ont., May 12th, 1900. (*Macoun.*)

813. **P. aciculari-pungens,** C. M. & KINDB.

On the ground, Halifax Co., N.S., July, 1894. (*J. Moser.*) On rocks in a ravine, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898 ; on rocks, Otter Slide Creek, Algonquin Park, Ont., July 19th, 1900. (*Macoun.*)

1171. **P. diversifoliun,** KINDB. in litt.

Fort Chimo, Ungava Bay, Labrador, Aug. 27th, 1896. (*A. P. Low.*)

814. **P. undulatum,** BRUCH & SCHIMP.

Loring, Juneau, and also at Salmon Creek, near Juneau, Sitka. (*Miss G. Cooley.*)

127. AMBLYSTEGIUM, Schimp.

815. **A. minutissimum,** SULLIV. & LESQ.

On earth in a ravine at Goldstream, near Victoria, Vancouver Island, June 2nd, 1893. (*Macoun.*)

816. **A. Sprucei,** BRUCH & SCHIMP.

On old logs, Jumping Pound Creek, and on earth, Crow's Nest Pass, Rocky Mountains, Alta., 1897. (*Macoun.*) In good fruit at Dawson, Yukon, August 7th, 1899. (*Williams.*)

817. **A. speirophyllum,** KINDB.

Mr. L. C. Cheney says of this species that it is sterile and probably a form of *A. irriguum* or *A. varium.* (Bot. Gaz. Vol. XXIV 141).

819. **A. subtile,** BRUCH & SCHIMP.

On bark of trees, Câche Lake, Algonquin Park, Ont., June, 1900. (*Macoun.*)

822. **A. serpens,** BR. EUR. var. **subenerve,** REN. & CARD.; Bot. Gaz., Vol. XXX., p. 22.

Bay of Islands, Newfoundland. (*Waghorne.*)

1172. **A. pseudo-confervoides,** KINDB., Revue Bryol., 1895.

Leaves smaller, shorter and less distinctly denticulate than in *A. confervoides*; cells wider oval-oblong. Stem-leaves ovate-oblong obtusate acute or short-acuminate. Branch-leaves suberect when moist. Capsule arcuate; lid conic-obtuse; pedicel very short. Perichetial leaves nearly entire. Stems and branches subjulaceous.

On flat limestone rocks near the Experimental Farm, west of Ottawa, Ont., April 16th, 1893; also in same habitat at Carleton Place, Ont., and west of Hull, Que., 1899. (*Macoun.*)

823. **A. porphyrhizon,** (LINDB.) SCHIMP.

On rocks, Credit Forks, Ont., Sept., 1893. (*Jas. White.*) On old logs at Baddeck, Cape Breton Island, N.S., July 1898; on earth along Scull Creek, Crane Lake Assa., June, 1894; on earth along Jumping Pound Creek, Rocky Mountains, 1897. (*Macoun.*)

824. **A. varium,** (HEDW.) LINDB.

On rotten logs, Edmonton, Ont., Oct., 1892. (*Jas. White.*) In woods, Câche Lake, Algonquin Park, Ont., 1900; quite common

on stones and earth at Niagara and Queenston, Ont., 1901 ; on earth in the Cypress Hills, Assa., June, 1894 ; on rocks, Crow's Nest Pass, Rocky Mountains, Alta., Aug., 1897. (*Macoun.*)

825. **A. orthocladon,** (Beauv.) Lesq. & James Reduced to *A. varium* by Mr. L. S. Cheney. Bot. Gaz., Vol. XXIV., 265.

On earth below Queenston Heights, Ont., May 8th, 1901. (*Macoun.*)

827. **A. fluviatile,** Bruch & Schimp.

On stones in brooks, Cape Breton Island, N.S., July, 1898 ; Meech's Lake, Que., and in Rockcliffe Park, Ottawa, Ont., 1900. (*Macoun.*)

828. **A. curvipes,** Grumb.

A. Kochii, Bruch & Schimp. ; L. C. Cheney. Bot. Gaz., Vol. XXIV., p. 265.

On old logs, Foster's Flats, Niagara Falls, Ont., May 13th, 1901 ; on earth at the base of trees in woods at Tilsonburgh, Ont., June 26th, 1901. (*Macoun.*)

829. **A. adnatum,** (Hedw.) Lesq. & James.

On stones in woods, Credit Forks, Ont., 1892. (*Jas. White.*) On sandstone rocks, Cypress Hills, Assa., June, 1894. (*Macoun.*)

1173. **A. Lescurii,** Sulliv. ; Lesq. & James Mosses of N. America, 376.

Platyloma Lescurii (Sulliv.) ; Kindb., Bryol. N. Am. & Eur., 79.

On wet rocks, Joe Creek, and Petewawa River, Algonquin Park, Ont., July 1900. (*Macoun.*)

831. **A. compactum,** (C. Muell.) Bruch & Schimp.

Very common at Dawson, Yukon. (*Williams.*)

128. HYPNUM, Linn.

Subgenus I. **CAMPYLIUM, Linn.**

836. **H. hispidulum,** Brid.

On earth by the bases of trees, Edmonton, Ont., 1892. (*Jas. White.*) On dead sticks, Otter Slide Creek, Algonquin Park, Ont.,

July, 1900; at Camlachie and Wyoming, Lambton Co., Ont., 1901. (*Macoun.*) On logs, at Dawson, Yukon. In fruit, July 16th, 1899. (*Williams.*)

839. **H. chrysophyllum,** BRID.

Dawson, Yukon. (*Williams.*) On old logs at the Tunnel, Sarnia, Ont., 1901. (*Macoun.*)

843. **H. Macounii,** KINDB.

L'Anse-au-Mort, Labrador, 1894 ; on rocks, Cook's Brook and Middle Arm, Newfoundland, 1896-97. (*Waghorne.*)

844. **H. stellatum,** SCHREB.

Head of Lake Bennett and at Dawson, Yukon. (*Williams.*)

845. **H. polygamum,** (BRUCH & SCHIMP.) WILS.

On earth in a bog at Galt, Ont., 1901. (*Macoun.*) Klondike River bottom, Yukon. (*Williams.*)

1174. **H. sinuolatum,** KINDB. in Hedwigia, 1897, p. 47.

Leaves sinuolate short-acuminate; alar cells hyaline, the others sublanceolate ; costa long, somewhat thick. Stem irregularly divided. Tufts dense. Capsules unknown.

On rocks in a ravine, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898. (*Macoun.*)

1175. **H. Fitzgeraldi,** RENAULD ; Kindb., Bryol. N. Am. & Eur. 120.

Newfoundland. (*Waghorne.*)

Subgenus II. HARPIDIUM.

1176. **H. aduncum,** LINN.

Newfoundland. (*Waghorne.*) Digge's Island, Hudson Bay, 1885. (*Dr. R. Bell.*) In the vicinity of Belleville, Hastings Co., and in a swamp at Wooler, Ont.; swampy ground, Jupiter River, Anticosti, Que., 1883 ; Cottonwood Coulée, Battle Creek, south of Cypress Hills, Assa., July, 1895 ; swampy earth at Kamloops, B.C., June, 1889. (*Macoun.*)

847. **H. Sendtneri,** SCHIMP.

On stones in a brook near Aspy Bay, Cape Breton Island, N.S. Aug., 1898; in pools in the Cypress Hills, Assa., June 24th, 1894; in a swamp at Johnstone's Harbour, Bruce Peninsula, Ont., Aug., 1901. (*Macoun.*)

848. **H. Cossoni,** SCHIMP.

On earth in wet places, Fort Chimo, Ungava Bay, Labrador, Aug., 1896. (*A. P. Low.*)

849. **H. vernicosum,** LINDB.

In a swamp, Mosquito Bay, Labrador, Lat. 61° 25′, Aug. 13th, 1898. (*A. P. Low.*)

1177. **H. subsecundum,** KINDB., Revue BRYOL., 1895.

Leaves not large, nearly crowded, entire; cells linear, the lower basal, yellow; costa vanishing below the acumen. Stem-leaves from a broad-ovate base,short-acuminate; costa very thick,branch leaves from a subovate base (more or less gradually) long-subulate, subsecund when dry; costa thinner. Capsule arcuate; pedicel short; teeth brownish. Stem creeping.

Newfoundland. (*Waghorne.*) On earth, Credit Forks, Ont., Sept., 17th, 1892. (*Jas. White.*)

850. **H. Wilsoni,** SCHIMP.

Cottonwood Coulée, Battle Creek, south of Cypress Hills, Assa., July 4th, 1895. (*Macoun.*) Middle of Lake Lebarge, Yukon. (*Williams.*)

851. **H. brevifolium,** LINDB.

H. Bambergeri, Schimp.; Kindb., Bryol. N. Am. & Eur., 130.

On rocks, Jumping Poun l Creek, Rocky Mountains, Alta., June 14th, 1897. (*Macoun.*)

853. **H. revolvens,** SWARTZ.

Boggy places, Nagai Island, Alaska, Sept., 1897. (*J. M. Macoun.*) In a bog north of Prince Albert, Sask., July 3rd, 1896 (*Macoun.*) Common in swamps at Dawson, Yukon. (*Williams.*)

854. **H. fluitans,** LINN.

In bogs, Sable Island, N.S., 1899 ; in bogs, Johnston's Lake, near North Wakefield, Que., 1898 ; abundant, Algonquin Park, Ont., 1900. (*Macoun.*) In swamps near Marsh Lake, Yukon. (*Williams.*) Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

855. **H. exannulatum,** GUEMBEL.

Boggy spots and ponds, Sable Island, N.S., Aug., 1899. (*Macoun.*) Bogs, Fort Chimo, Ungava Bay, Labrador, September, 1896. (*A. P. Low.*) Bogs on Barren Grounds, Lat. 62° 56′, Long. 102° 45′ W., Aug., 1893. (*J. B. Tyrrell.*)

Subsp. **pseudo-lycopodioides,** KINDB., Ott. Nat. Vol. XIV. p. 82.

Agrees with *H. exannulatum* in the leaves being long-decurrent and with large hyaline alar cells ; but the leaves are shortish and entire with generally an obtusate acumen ; costa thicker. Capsules not seen. Resembles in habit *Calliergon ochraceum* but the stem-leaves are plicate as in *Hypnum lycopodioides.*

On stones in woods at Margaree, Cape Breton Island, N.S., July, 1898. (*Macoun.*)

Subsp. **pseudo-stramineum,** KINDB., Bryol. N. Am. & Eur. 132.

Leaves green, entire, often straight ; those of the branches often with oblong apical cells. Capsules not seen.

Newfoundland. (*Waghorne.*) In pools near Victoria, and on earth in a wet field on Sea's farm, near Esquimalt, Vancouver Island, May, 1893. (*Macoun.*)

856. **H. uncinatum,** HEDW.

Cañon City and Dyea Creek, Alaska ; Lake Lindeman, Lake Lebarge and Dawson, Yukon. (*Williams.*) Chilliwack Valley, B.C. (*J. M. Macoun.*)

Var. **micropterum,** KINDB.

St. Paul Island and St. George Island, Behring Sea, July, 1892. (*J. M. Macoun.*)

Var. **plumulosum,** SCHIMP.

Among boulders in rather dry places, Lake Lindeman, Yukon. *(Williams.)*

Var. **subsymmetica,** (CARD.) KINDB.

In the Chilliwack Valley, B.C., 1901. *(J. M. Macoun.)*

857. **H. Moseri,** KINDB.

Fort Chimo, Ungava Bay, Labrador, Sept., 1896. *(A. P. Low.)* On rocks, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898. *(Macoun.)*

1178. **H. orthothecioides,** LINDB. ; KINDB., Bryol. N. Am. & Eur. 133.

Greenland. *(Dr. Rosenwinge.)*

858. **H. longinerve,** KINDB.

In a pool in woods, Victoria Park, Ottawa Ont., June 19th. 1900. *(Macoun.)*

859. **H. conflatum,** C. M. & KINDB.

Middleton Island, Alaska, Lat. 59° 30′, 1892 ; St. Paul Island, Behring Sea, July, 1892. *(J. M. Macoun.)*

1179. **H. amblyphyllum,** R. S. WILLIAMS, Bull. of New York Bot. Gar., Vol. II., p. 139.

Alar cells often inflated nearly to costa and some small, nearly quadratic cells at margin just above the alar cells. Medium leaf-cells ·005 or ·006 mm. wide and mostly .035 to .060 mm. long. Younger branch leaves narrowly lanceolate with very short costa. Perichetial leaves not plicate, closely sheathing, but little larger or more pointed than stem leaves, entire, with faint costa extending up ⅔ or more. Seta up to 6 cm. long. Capsule 2.5 by 1 mm., with short upright collum, but much curved and nodding above. Lid acutely conical, its height less than basal diameter. No annulus. Peristome teeth broadly hyaline bordered above, outer plates finely punctate below. Basal membrane of endostome scarcely ½ the teeth in height with solid segments and 2 or 3 nodose cilia between. Transversely elongated cells about mouth

of capsule in 3 or 4 rows, the cells below roundish to oblong. Stomata roundish to short oblong, up to .040 mm. long Minutely roughened spores up to .016 mm.

This species is intermediate between *exannulatum* and *pseudostramineum*. From the first it differs in the short, broadly-pointed leaves, the angular stem with fewer thickened cells in the outer walls and leaf cells not pitted. The second differs in being monoecious, with entire, not decurrent leaves and not angular stems.

At Dawson, Yukon, in swamp water, in fine fruit July 17th, 1898. (*Williams.*)

Subgenus III.—**CRATONEURON, Sulliv.**

860. **H. filicinum,** Linn.

On rocks by springs, Niagara River, May, 1901. (*Macoun.*) In springs, head of Lake Bennett, Yukon. (*Williams.*)

861 **H. chloropterum,** C. M. & Kindb.

Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

862. **H. Novæ-Angliæ,** Sulliv. & Lesq.

On old logs, Meech's Lake, near Chelsea, Que., Sept. 23rd, 1893. (*Macoun.*)

863. **H. commutatum,** Hedw. subsp. **sulcatum,** Schimp. Kindb., Bryol. N. Am. & Eur., 127.

Greenland. (*Berggren.*) Newfoundland. (*Waghorne.*)

864. **H. falcatum,** Brid.

On earth about springs, Jumping Pound Creek, Alta.; also Crow's Nest Pass, Alta., Rocky Mountains, Aug., 1897. (*Macoun.*) About springs at the head of Lake Bennett, Yukon. Leaves nearly entire or slightly serrulate below. (*Williams.*)

865. **H. decipiens,** (De Not.) Kindb.

In a spring, Medicine Lodge, south of Wood Mountain, Assa., June 14th, 1895. (*Macoun.*) Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

Subgenus IV.—**RHYTIDIUM, Sulliv.**

866. **H. rugosum,** Linn.

Fort Chimo, Ungava Bay, Labrador, Aug., 1896. (*A. P. Low.*) On Pike's Portage, Great Slave Lake, May, 1900. (*J. W. Tyrrell.*) Lake Marsh, and Mile's Cañon, sterile specimens abundant, Dawson ; fruit not rare. (*Williams.*)

Subgenus V.—**CTENIUM, Sulliv.**

867. **H. crista-castrensis,** Linn.

Lake Lindeman and Klondike River bottom. Not found in fruit. (*Williams.*)

Subgenus VI.— **CTENIDIUM, Hedw.**

1180. **H. molluscoides,** Kindb., Revue Bryol. 1895.

Leaves nearly entire, distinctly decurrent ; alar cells somewhat large, well-defined. Capsule small, cylindric, arcuate. Otherwise like *H. molluscum*, Hedw.

On logs, Bay Bull Arm, Newfoundland. (*Waghorne.*) On old logs, Baddeck, Cape Breton Island,N.S., July 9th, 1898. (*Macoun.*)

1181. **H. Alaskæ,** Kindb., Bryol. N. Am. & Eur. 142.

Leaves entire, sub-decurrent, gradually acuminate ; alar cells large, hyaline well-defined. Capsule subovate or arcuate ; pedicel short. Tufts green or pale yellow. Stem creepi g subpinnate or plumiform.

On old logs, Newfoundland. (*Waghorne.*) On trees, Canaan Forks, Queen's Co., N.B., Oct., 1894. (*J. Moser.*)

Subgenus VII.—**DREPANIUM, C. Muell.**

1182. **H. reptiliforme,** Kindb., Revue Bryol. 1895.

Differs from *H. reptile ;* leaves larger, long-acuminate ; those of the stem ovate-oblong, denticulate above, those of the branches ovate-lanceolate, denticulate all around; alar cells large hyaline. Capsule pale yellow ; segments yellow ; lid not seen ; pedicel longer.

On the bases of trees in woods, Brighton, Northumberland Co., Ont., Oct. 13th, 1893. (*Macoun.*)

1183. **H. perichætiale,** Br. Eur.; Kindb., Bryol, N. Am. & Eur., 137.

Leaves subovate, acute or sometimes short-acuminate; alar small, dusky, on a narrow triangular space, the others lanceolate-oblong. Capsule finally brown; pedicel short.

On boulders in woods at Ottawa, Ont., Sept., 1891. (*Macoun.*)

869. **H. reptile,** Michx.

On rocks at Dawson, Yukon. Leaves not decurrent. (*Williams.*)

870. **H. pallescens,** Schimp.

Stony Lake, Peterboro Co., Ont., July, 1892. (*Thos. Walker.*) Credit Forks, Ont., 1892. (*Jas. White.*)

871. **H. fertile,** Sendt.

Very common in woods on rocks, earth and logs at Baddeck, Margaree and Half-Way Brook, Cape Breton Island, N.S., 1898; on old logs at Woodstock, N.B., July, 1899; common at Casselman, near Ottawa, Ont., June, 1892; also on old logs, Câche Lake, Algonquin Park, Ont., June, 1900. (*Macoun.*)

872. **H. Waghornei,** Kindb.

H. Canariense, Mitt.; Kindb., Bryol. N. Am. & Eur. 148.

On damp rocks, Woodstock, N.B., June 3rd, 1899; on old logs in woods at Baddeck, Cape Breton Island, N.S., July, 1898. (*Macoun.*)

873. **H. fastigiatum,** Brid.

Near Halifax, N.S., June 19th, 1883; on trees in woods at Owen Sound, Ont., Sept. 12th, 1890. (*Macoun.*) Fort Chimo, Ungava Bay, Labrador, August, 1891. (*A. P. Low.*)

874. **H. hamulosum,** Bruch & Schimp.

Port Etches, Alaska, Lat. 60° 30', June 18th, 1892. (*J. M. Macoun.*) At the bases of trees in damp places, at Dawson, Yukon. (*Williams.*)

1184. **H. implexum,** Ren. & Card., Bot. Gaz., Vol. XXII., 52.

Tufts depressed, light green. Stems intricate, pinnately ramulose, branchlets hooked, fastigiate above. Leaves falcate-secund,

from a broadly ovate-deltoid base rather suddenly constricted into a narrow subulate acumen, plane on the margins, quite entire or subdenticulate at the base of the acumen ; costa double, short; cells narrowly linear, those of the angles few but distinct, small, quadrate, greenish or pellucid. Fruit and flowers unknown.

Allied to *H. hamulosum*, Schimp., but more robust and distinct by the light-green tint; the leaves broader at base and more suddenly constricted into a subulate acumen and the alar cells more numerous and more conspicuous, much resembling the small green form of *H. cupressiforme*, Linn., but in this the leaves are narrower and the alar cells much more numerous and conspicuous.

Seal Island, Labrador, 1893. (*Waghorne.*)

1185. **H. subeugyrium,** Ren. & Card., Bot. Gaz.,Vol. XXII., 52.

Monoecious, resembling *H. eugyrium*, Sch., var. *MacKayi*, Sch., from which it differs by the alar cells of the leaves small, quadrate, not forming excavate auricles and the capsule exannulate. From the forms of *H. palustre*, Linn., having the leaves subimbricate, it is distinguishable by the minutely denticulate apex of the leaves and by the costa always double and shorter.

Bay of Exploits, Newfoundland, 1893. (*Waghorne.*) On rocks in a brook at Woodstock, N.B., July 3rd, 1899 ; on wet rocks, Petawawa River, Algonquin Park, Ont., July 24th, 1900. (*Macoun.*)

1186. **H. orbicularicordatum,** Ren. & Card., Bot. Gaz., Vol. XXII., p. 52.

Tufts very soft, pale lurid green above, discoloured whitish yellow and brownish-variegated below. Stems slender, erect 4—9 cm. high, simple or sparingly branching, not radiculose, cuspidate at apex. Leaves soft, erecto-patent or very loosely imbricate, subundulate when dry, decurrent at base, broadly cordate-suborbicular, very obtuse, quite entire, slightly sulcate; costa thin, vanishing far from the apex; areolation loose, pellucid; cells soft, thin-walled, rhomboidal-hexagonal in the middle, the marginal narrower, the upper shorter, the alar very loose, large soft and empty. Flowers and fruit unknown.

Depot Island, northwest shore of Hudson Bay, Lat, 63° 59′, W. Long. 90° 20′ 1893. (*George Comar.*)

Easily distinguished from the allied *H. cordifolium*, Hedw., by the nearly simple stems, the very soft leaves, and the broader and looser areolations.

876. **H. circinale,** Hook.

Common in the Chilliwack Valley, B.C. (*J. M. Macoun.*) At Salmon and Sheep creeks, near Juneau, Alaska. (*Miss G. Cooley.*) In good fruit March 28th, 1898, Cañon City, Dyea Creek; also common on fallen logs at Skagway, Alaska. (*Williams.*)

877. **H. Sequoieti,** C. Muell.

Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

1187. **H. subplicatile,** (Lindb.) Limpr.

On damp earth and rock, Lake Lindeman, Yukon. This plant is very closely related to *callichroum* but differs in being rather smaller with regularly pinnate branches, leaves wider just above the base and abruptly narrowed to the insertion, capsule shorter. (*Williams.*)

880. **H. imponens,** Hedw.

On logs in swamps, Edmonton, Ont., 1893. (*Jas. White.*) On rocks in a ravine, Margaree, Cape Breton Island, N.S., July, 1898; on logs in woods Otter Slide Creek, Algonquin Park Ont., July, 1900; on old logs below Queenston Heights, Ont., 1901. (*Macoun.*)

881. **H. subimponens,** Lesq.

At Sheep Creek and at Gold Creek Cañon, near Juneau, Alaska. (*Miss G. Cooley.*)

882. **H. revolutum,** (Mitt.) Lindb.

On rocks, Moose Mountain, Elbow River, Rocky Mountains, Alta., July, 1897; on birch bark, Algonquin Park, Ont., June 8th, 1900. (*Macoun.*) Lake Lindeman and Lake Marsh, Yukon. (*Williams.*)

883. **H. plicatile,** (Mitt.) Lesq. & James.

On rocks, Jumping Pound Creek, Braggs' Creek, Elbow River, and Crow's Nest Pass, Rocky Mountains, Alta., 1897. (*Macoun.*)

884. **H. cupressiforme,** Linn.

On sandy soil, Sable Island, N.S., Aug., 1899; on trunks, Câche Lake, Algonquin Park, Ont., 1900. (*Macoun.*)

Var. **resupinatum,** Sch.; Ren. & Card. Bot. Gaz., Vol. XXX., p. 23.

Chance Cove, Newfoundland, 1891. (*Waghorne.*)

Var. **brevisetum,** Schimp.

On rock, Lake Marsh, Yukon. The sterile specimens referred here possibly belong elsewhere, yet they come very close to this variety. (*Williams.*)

1188. **H. Vaucheri,** Lesq.

Newfoundland. (*Waghorne.*) At the base of a tree at Dawson, Yukon. This species is dioecious. The leaves are entire with flat borders. (*Williams.*)

887. **H. Lindbergii,** Mitt.

On rocks at the Cascades, Gatineau River, Que., June, 1900; on stones and logs by a brook, Algonquin Park, Ont., June, 1900; on rocks and stones below Queenston Heights, Ont.; on logs in woods at Point Edward, Sarnia, Ont., 1901. (*Macoun.*)

Var. **elatum,** Schimp.

In swamps, Lake Lindeman, Yukon. (*Williams.*)

1189. **H. pseudo-recurvans,** Kindb., Bryol. N. Am. & Eur. 140.

Differs from *H. Jamesii*, Sulliv.; leaves denticulate all around, ovate-lanceolate, long-acuminate gradually tapering to a filiform point. Perichetial leaves entire below the long-linear point. Capsule obovate. Tufts olivaceous, sparingly radiculose. Lid of capsule and male flowers not seen. Habit of *H. cupressiforme.*

On the base of a tree, Revelstoke, B.C., May 5th, 1890. (*Macoun.*) Referred to *Raphidostegium recurvans* in Part VI., p. 208.

1190. **H. pseudo-complexum,** KINDB., Revue Bryol., 1895.

Leaves entire, not appressed when dry; upper cells lanceolate, lower oblong, angular, (alar) suboval, small not well defined. Stem-leaves ovate or ovate-oblong. Branch-leaves ovate-lanceolate longer-acuminate, often falcate. Tufts dense, pale green. Stems eradiculose irregularly divided ; branches not compressed. Capsules unknown. Resembles a var. of *H. molluscum* in habit.

Port Etches, Alaska, June 16th, 1892. (*J. M. Macoun.*)

1191. **H. filiforme,** KINDB., Revue Bryol. 1895.

Stem-leaves distant. Leaves ovate with a short subulate or longer and filiform point, faintly denticulate at acumen ; those of the stem recurved at one side; upper cells lanceolate,lower oblong, alar few, hyaline. Tufts green, loose and eradiculose, stem long, pinnate; branches distant ; paraphyllia broad, very few. Capsules unknown. Dioecious.

On rocks at Banff, Rocky Mountains, July, 1891. (*Macoun.*)

889. **H. curvifolium,** HEDW.

On old logs in woods at Camlachie, Lambton Co., Ont., June 18th, 1901. (*Macoun.*)

890. **H. pratense,** KOCH.

On hummocks in a swamp at Dawson, Yukon. (*Williams.*)

1192. **H. subcomplexum,** KINDB., Revue Bryol. 1895.

Differs from *H. Vaucheri*, Lesq. ; leaves larger and shorter, abruptly narrowed from a subovate base ; angular cells smaller and finally hyaline without special alar cells. Tufts green.

Sandstone rocks, Wood Mountain and Cypress Hills, Assa., June, 1894-95. (*Macoun.*)

894. **H. nemorosum,** KOCH.

On earth, Leamy's Lake, Hull, Que., Nov. 9th, 1896. (*Macoun.*)

1193. **H. pseudo-nemorosum,** KINDB., BRYOL. N. Am. & Eur. 123.

Leaves ovate-oblong, denticulate at the subulate acumen, not distinctly recurved, decurrent, not yellow at insertion ; alar cells

small, few, dusky on a short triangular space; apical cells lanceolate, the inner linear-lanceolate. Tufts glossy-velvet-like. Stem subpinnate; branches faintly compressed; paraphyllia broad, not numerous. Capsules unknown. Habit of *Pylaisia velutina*.

Referred in Part VI., p. 240 to *H. nemorosum*. (*Macoun.*)

1194. **H. hamulosiforme**, KINDB. (N. Sp.) in litt.

On old logs in woods, Câche Lake, Algonquin Park, Ont., June 8th, 1900. (*Macoun.*)

SUBGENUS IX.—LIMNOBIUM, Bruch & Schimp.

898. **H. palustre,** HUDS.

Skagway, Alaska; Lake Marsh and Mile's Cañon, Yukon. (*Williams.*)

1195. **H. Bestii,** REN. & BRYHN.

This plant is described as a subspecies of *molle* by Renauld and Bryhn, but I think it will stand as a distinct species. It differs from *molle* in having no central strand. It is a larger species also with stems below wiry and harsh with the bases of the broken-off leaves.

Skagway, Alaska. (*Williams.*)

900. **H. dilatatum,** WILS.
H. alpinum, Schimp.

Lake Lindeman, Yukon. (*Williams.*)

903. **H. polare,** LINDB.

Growing along the wet shore of Lake Lindeman, Yukon. (*Williams.*)

908. **H. alpestre,** SWARTZ.

Skagway, Alaska; also Lake Lindeman, Yukon. (*Williams.*)

910. **H. pseudo-montanum,** KINDB.

Port Etches, Alaska, Lat. 60° 30′, June 13th, 1892. (*J. M. Macoun.*)

911. **H. eugyrium,** SCHIMP.

On wet rocks, Hunter's Home, Queen's Co., New Brunswick, 1892. (*J. Moser.*) On stones in brooks, Big Intervale, Margaree, Cape Breton Island, N.S., July 20th, 1890. (*Macoun.*)

912. **H. ochraceum,** TURNER.

On rocks, Skeena River, B.C., May 13th, 1892. (*J. M. Macoun.*) Very abundant on stones in brooks in all parts of Cape Breton Island, N.S., 1898 ; on stones in a brook, Woodstock, N.B., July, 1899. (*Macoun.*) On rocks in bed of stream at Dawson, Yukon. (*Williams.*)

913. **H. stramineum,** DICKS.

Fort Chimo, Ungava Bay, Labrador, Aug., 1896. (*A. P. Low.*) On earth in wet places, Baddeck, Cape Breton Island, N.S., 1898; on earth in a bog, Câche Lake, Algonquin Park, Ont., 1900. (*Macoun.*) Lake Lindeman, Yukon. (*Williams.*)

915. **H. turgescens,** (JENSEN.) SCHIMP.

In a dried up swamp just below the White Horse Rapids, Yukon. Growing in broad depressed mats. (*Williams.*)

Var. **uliginosum,** LINDB.

In swamps, with the preceding. This variety has elongated stems, and distant, more or less spreading leaves. (*Williams.*)

916. **H. scorpioides,** LINN.

Just above Lake Lindeman in blackish mats almost covering the bottom of a small pond, 12 or 15 inches below the surface. (*Williams.*)

Var. **gracilescens,** SANIO.

In a dried up swamp a few miles below White Horse Rapids, Yukon, covering extensive areas with a mat up to 18 cm. thick. (*Williams.*)

917. **H. badium,** HARTM.

On the margin of a pond just below snow banks about 1000 feet above Lake Lindeman, Yukon ; also at Dawson on wet shady banks. (*Williams.*)

Subgenus X. **CALLIERGON, Lesq. & James.**

918. **H. cordifolium,** Hedw.

Boggy places, St. Paul and St. George islands, Behring Sea, 1897. (*J. M. Macoun.*) In bogs in wet woods, Baddeck, Cape Breton Island, N.S., July, 1898. (*Macoun.*) Klondike River bottom near the mouth. (*Williams.*)

919. **H. giganteum,** Schimp.

In a swamp at Golden Lake, Ont., 1900; water holes, Crow's Nest Lake, Rocky Mountains, Alta., 1897. (*Macoun.*) The var. *fluitans* was found in a small stream flowing into Lake Marsh, Yukon. (*Williams.*)

Var. **Labradorense,** Ren. & Card. Bot. Gaz. Vol. XIX., p. 240.

A notable variety, distinct from the type by the leaves larger and longer and the costa attenuate, vanishing rather far from the apex and often forking.

Battle Harbour, Labrador, 1892. (*Waghorne.*)

920. **H. Richardsoni,** (Mitt.) Lesq. & James.

Fort Chimo, Ungava Bay, Labrador, Aug., 1896. (*A. P. Low.*) In a bog, Johnston's Lake, North Wakefield, Que., June, 1898. (*Macoun.*) At Dawson in swamps; in fine fruit, July 27th. (*Williams.*)

921. **H. sarmentosum,** Wahl.

In a small pond by snow banks about 1000 feet above Lake Lindeman, Yukon (*Williams.*)

Var. **fontinaloides,** Berggren.

On rocks in the bottom of a small stream near the mouth of Bonanza Creek, Yukon. This is a variety with long slender stems and larger leaves often all green or partly green and partly purple. (*Williams.*)

922. **H. cuspidatum.** LINN.

On earth in wet woods at Louisburg, Cape Breton Island, N.S., Aug., 1898; in a springy place by the railway, near Dow's swamp, Ottawa, Ont., 1900. (*Macoun.*)

1196. **H. subgiganteum,** KINDB., Ott. Nat. Vol. XIV., p. 80.

Differs from *H. giganteum* in having monoecious inflorescense, from *H. cordifolium* in having stems or branches pinnate and leaves auricled—from both in the very short costa of the leaves, which in stem leaves is generally nearly indistinct, in branch leaves reaching nearly to the middle.

In a bog north of the Saskatchewan at Prince Albert, Sask., June 30th, 1896. (*Macoun.*)

924. **H. Schreberi,** WILLD.

Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

129. HYLOCOMIUM, Schimp.

925. **H. splendens,** (HEDW.) SCHIMP.
H. proliferum, Linn.; Kindb., Bryol. N. Am. & Eur., 41.

Very common in all thick woods across the continent. Loring, Sitka, Salmon Creek, and Cañon Creek, near Juneau, Alaska. (*Miss G. Cooley.*) St. Paul Island, Behring Sea. (*Dr. Merriam.*) Lake Lindeman, Thirty-mile River, and Dawson, Yukon. An abundant species. (*Williams.*) Chilliwack Valley, B.C. (*J. M. Macoun.*)

927. **H. umbratum,** (Ehrh.) Schimp.

On old logs in woods, Big Intervale, Margaree and Baddeck, Cape Breton Island, N.S., 1898. (*Macoun.*)

928. **H. pyrenaicum,** (SPRUCE) LINDB.

On rocks by a brook at Meech's Lake, near Chelsea, Que., Sept. 23rd, 1893. (*Macoun.*) On rock, Lake Lindeman, Yukon. (*Williams.*)

929. **H. brevirostre,** (EHRH.) SCHIMP.

In a damp ravine, Grand Narrows, Cape Breton Island, N.S., July 27th, 1898. (*Macoun.*)

930. **H. squarrosum,** Linn.

Quite common on old logs in damp woods, Big Intervale, Margaree, Cape Breton Island, N.S., July, 1898. (*Macoun.*) Canaan Forks, Queen's Co., N.B., 1894. (*J. Moser.*) Lake Lindeman, Yukon. (*Williams.*)

931. **H. triquetrum,** (Linn.) Bruch & Schimp.

Roundhouse woods, Niagara Falls, 1901. (*Macoun.*) Yukon River below Fort Selkirk and Klondike River bottom, near its mouth. Not apparently very common. (*Williams.*)

932. **H. robustum,** (Hook.) Kindb.

Chilliwack Valley, B.C., 1901. (*J. M. Macoun.*)

933. **H. loreum,** (Linn.) Schimp.

Common on old logs at Big Intervale, Margaree, Cape Breton Island, N.S., 1898. (*Macoun.*) Port Etches, Alaska, Lat. 60° 30′. (*J. M. Macoun.*) Sitka, Loring, Juneau, alt. 3,000 feet; Sheep Creek, near Juneau, Alaska. (*Miss G. Cooley.*) Cañon City, Dyea Creek and Skagway, Alaska. (*Williams.*)

LIBRARY OF THE UNIVERSITY OF CALIFORNIA

INDEX.

HEPATICEÆ.

PAGE

Anastrophyllum, Stephani..... 15
Reichardtii, (Gottsche)..... 15
Aneura, Dumort..... 7
latifrons, Lindb..... 7
multifida, var. ambrosioides, (Nees)..... 8
palmata, (Hedw.)..... 7
pinguis, (Linn.)..... 7
pinnatifida, Nees..... 7
sessilis, (Sprengel)..... 7
Anthelia, Dumort..... 36
julacea, (Linn.)..... 36
juratzkana, (Limpr.)..... 36
ANTHOCEROTACEÆ..... 48
Anthoceros, Linn..... 48
fusiformis, Aust..... 48
laevis, Linn..... 48
Macounii, Howe..... 48
punctata, Linn..... 48
stomatifer, Aust..... 48
Arnellea, Lindb..... 13
fennica, (Gottsche)..... 13
Asterella, Beauv..... 3
Californica, (Hampe)..... 3
fragrans, (Schleich.)..... 4
gracilis, (Web. f.)..... 4
violacea, (Aust.)..... 4
Bazzania, S. F. Gray..... 33
denudata, (Torrey.)..... 33
triangularis, (Schleich.)..... 33
trilobata, (Linn.)..... 33
Blasia, Linn:..... 9
pusilla, Linn..... 9
Blepharostoma, Dumort..... 35
setiformis, (Ehrh.)..... 35
trichophyllum, (Linn.)..... 35
Caesia concinnata, (Dicks.)..... 10
corallioides, (Nees.)..... 11
obtusa, (Lindb.)..... 10
Cephalozia, Dumort,..... 28
Austini, Pears..... 32
bicuspidata, (Linn.)..... 29
catenulata, (Hüben.)..... 29
curvifolia, (Dicks-)..... 28
dentata, (Raddi.)..... 31
divaricata, (Smith)..... 30
extensa, Pears..... 29
fluitans, (Nees.)..... 30
Lammersiana, Pears..... 29
leucantha, Spruce..... 31
Macounii, Aust..... 31
media, Lindb..... 28
minima, Aust..... 31

HEPATICEÆ.—*Con.*

PAGE

multiflora, Spruce..... 28
pleniceps, (Aust.)..... 30
Sullivantii, Aust..... 31
Chandonanthus setiformis, (Ehrh.)..... 35
Chiloscyphus, Corda..... 26
adscendens, Hook. & Wilson..... 26
polyanthos, (Linn.)..... 26
var. rivularis, Nees..... 27
Clevea, Lindb..... 3
hyalina, (Somm.)..... 3
Cololejeunea, Schiffn..... 45
Biddlecomiæ, (Aust.)..... 45
Macounii, (Spruce.)..... 45
Conocephalum, Wiggers..... 4
conicum, (Linn.)..... 4
Cyathophora, S. F. Gray..... 5
quadrata, (Scop.)..... 5
Diplophylleia, Trevis..... 37
albicans, (Linn.)..... 37
argentea, (Tayl.)..... 38
obtusifolia, (Hook.)..... 38
plicata, (Lindb.)..... 39
taxifolia, (Wahl.)..... 38
Fimbriaria Californica, Hampe..... 3
pilosa, (Wahlenb.)..... 4
tenella, Nees..... 4
violacea, Aust..... 4
Fossombronia, Raddi..... 9
angulosa, (Dicks)..... 10
foveolata, Lindb..... 10
longiseta, Aust..... 9
Macounii, Aust..... 10
pusilla, (Linn.)..... 9
Frullania, Raddi..... 45
Asagrayana, Mont..... 46
Asagrayana, Mont., var. *Californica*, Aust..... 47
Bolanderi, Aust..... 45
Californica, (Aust.)..... 47
Chilcootiensis, Steph..... 46
Eboracensis, Gottsche..... 46
Franciscana. M. A. Howe..... 47
Hallii, Aust..... 45
Nisquallensis, Sulliv..... 47
Oakesiana, Aust..... 45
Selwyniana, Pearson..... 47
tamarisci, (Linn.)..... 47
Virginica, Gottsche..... 46
Geocalyx, Nees..... 28
graveolens, (Schrad.)..... 28
Grimaldia, Raddi..... 3
fragrans, (Balb.)..... 3
rupestris, (Nees.)..... 3

HEPATICEÆ.—*Con.*

	PAGE
Gymnomitrium, Corda	10
concinnatum, (Lightf.)	10
corallioides, Nees	11
crenulatum, Gottsch	11
obtusum, (Lindb.)	10
revolutum, (Nees.)	11
Gyrothyra, M. A. Howe	13
Underwoodiana, M. A. Howe	13
Harpanthus, Nees	27
Flotowianus, Nees	27
scutatus, (Web. & Mohr.)	27
Hepatica conica, (Linn.)	4
Herberta, S. F. Gray	36
adunca, (Dicks.)	36
Hygrobiella, Spruce	31
laxifola, (Hook.)	31
JUNGERMANNIACÆ	10
Jungermannia, Linn	13
amplexicaulis, Dumort	14
atrovirens, Dumort	15
autumnalis, DC	13
caespiticia, Lindb	14
cordifolia, Hook	14
lanceolata, Linn	15
Mülleri, Nees., var. *maritima*	19
pumila, With	15
riparia, Tayl	15
sphærocarpa, Hook	14
Place in Wattiana, Aust	19
Kantia, S. F. Gray	32
Trichomanis, (Linn.)	32
Lejeunia, Libert	44
cavifolia, (Ehrh.)	44
patens, Lindb	45
Lepidozia, Dumort	34
filamentosa, (Lehm. & Lindb.)	34
reptans, (Linn)	34
setacea, (Web.)	35
Liochlæna lanceolata, Nees	15
Lophocolea, Dumort	25
bidentata, (Linn.)	25
cuspidata, (Nees.)	26
heterophylla, (Schrad.)	26
Macounii, Aust	25
minor, Nees	25
Lophozia, Dumort	15
alpestris, (Schleich.)	17
attenuata, (Mart.)	20
Bantriensis, (Hook)	20
barbata, (Schreb)	20
bicrenata, (Schmid)	19
capitata, (Hook.)	18
colpodes, (Tayl.)	19
excisa, (Dicks.)	19
exsecta, (Schmid.)	23
var. scituta, (Taylor.)	23
Floerkii, (Web. & Mohr)	21
var. alpina, Pearson	21
groenlandica, (Nees.)	19
guttata, (Lindb. & Arnell.)	17
Helleriana, (Nees.)	23
heterocolpa, (Thed.)	19
Hornschuchiana, (Nees)	18
incisa, (Schrad.)	15
inflata, (Huds.)	18
Kunzeana, (Hüben.)	22
longidens, (Lindb.)	18
lycopodioides, (Wallr.)	21
Michauxii, (Web.)	22
minuta, (Crantz.)	23
Mülleri, Nees	19
obtusa, (Lindb.)	18
ovata, (Dicks.)	24
plicata, (Hartm.)	18
polita, (Nees.)	22
quadriloba, (Lindb.)	22
quinquedentata, (Huds)	20
saxicola, (Schrad)	22
Vahliana, (Nees.)	19
ventricosa, (Dicks.)	16
var. longiflora, Nees	17
var. porphyroleuca, Nees	17
Wenzellii, (Nees.)	18
MARCHANTIACEÆ	2
Marchantia, (Linn.)	5
polymorpha, Linn	5
Marsupella, Dumort	11
densifolia, (Nees.)	12
emarginata, (Ehrh.)	11
var. aquatica, Pearson	11
sparsifolia, (Lindb.)	12
sphacelata, (Grisecke.)	12
METZGERIACÆ	6
Metzgeria, Raddi	6
conjugata, Lindb	6
hamata, Lindb	6
myriopoda, Lindb	6
pubescens, (Schrank.)	6
Mylia, S. F. Gray	24
anomala, (Hook.)	25
Taylori, (Hook.)	24
Nardia, S. F. Gray	12
compressa, (Hook.)	12
crenulata, (Smith.)	13
hæmatosticta, (Nees.)	12
obovata, (Nees.)	12
scalaris, (Schrad.)	12
Odontoschisma, Dumort	32
denudatum, (Nees.)	32
Macounii, Aust	32
sphagni. (Dicks.)	32
Pallavicinia, S. F. Gray	8
hibernica, (Hook.)	8
Lyellii, (Hook.)	8
Pellia, Raddi	8
endiviæfolia, (Dicks.)	9
epiphylla, (Linn.)	8
Neesiana, (Gottsche.)	9
Peltolepis, Lindb	2
grandis, Lindb	2

HEPATICEÆ.—*Con.*

	PAGE
Plagiochila, Dumort	24
asplenioides, (Linn.)	24
interruptus, (Nees.)	24
porelloides, (Torrey.)	24
Pleuroclada	34
albescens, (Hook.)	34
Islandica, (Nees.)	34
Porella, Dill	43
navicularis, (Lehm. & Lindb.)	43
pinnata, Linn	44
platyphylloidea, Pears	44
platyphylla, (Linn.)	43
rivularis, (Nees.)	44
Roellii, (Steph.)	44
Prasanthus, Lindb	13
suecicus, (Gottsche.)	13
Preissia commutata, Nees	5
Ptilidium, Nees	36
Californicum, (Aust.)	37
ciliare, (Linn.)	36
pulcherrimum, (Web.)	37
Radula, Dumort	42
arctica, Steph	43
Bolanderi, Gottsche	42
complanata, (Linn.)	42
Krausei, Steph	42
tenax, Lindb	43
Reboulia, Raddi	3
hemisphærica, (Linn.)	3
RICCIACEÆ	1
Riccia, Micheli	1
arvensis, Aust	1
Austinii, Steph	1
fluitans, Linn	1
lutescens, Schwein	1
sorocarpa, Bisch	1
Sullivantii, Aust	1
Ricciocarpa, Corda	2
natans, Linn	2
var. terrestris	2
Sauteria, Nees	2
alpina, (Nees & Bischoff.)	2
Scapania, Dumort	39
Bolanderi, Aust	39
brevicaulis, Tayl	42
compacta, (Roth.)	42
convexa, (Scop.)	41
curta, (Mart.)	41
glaucocephala, (Tayl.)	42
gracilis, (Lindb.)	41
imbricata, M. A. Howe	41
irrigua, (Nees.)	41
nemorosa, Dumort	39
Oakesii, Aust	40
subalpina, Pearson	39
uliginosa, (Sw.)	40
umbrosa, (Schrad.)	41
undulata, (Linn.)	40
Targionia, Linn	2
hypophylla, (Linn.)	2

HEPATICEÆ.—*Con.*

	PAGE
Trichocolea, Dumort	37
tomentella, (Ehrh.)	37

LICHENES.

Acolium, De Not.	171
tigillare, De Not.	171
tympanellum, (Ach)	171
Alectoria, (Ach.)	64
nigricans, Ach	65
ochroleuca, (Ehrh.), var. rigida, Fr	64
sarmentosa, (Ach.)	64
var. cincinnata, Fr	65
Arthonia, Ach	169
astroidea, Ach	169
dispersa, (Schrad.)	170
lecideella, Nyl	169
medilla, Nyl	169
patellulata, Nyl	169
populina, Mass	170
radiata, (Pers.)	169
raunidia, Nyl	170
spectabilis, Flot	169
Swartziana, Ach	169
tædiosa, Nyl	170
Bœomyces, Pers	140
æruginosus, (Scop.)	140
Byssoides, (Linn.)	140
placophyllus, Ach	140
roseus, Pers	140
Biatora, Fries	141
akompsa, Tuckerm	151
albo-fuscescens, (Nyl.)	145
arcuatula, (Arn.)	145
artyta, (Ach.)	149
asserculorum, Schrad	180
atrofusca, Flot	152
atrogrisea, (Delis.)	150
atropurpurea, (Mass.)	147
atro-rufa, (Dicks.)	141
Beckhausii, (Kœrb.)	151
Berengeriana, Th. Fr	144
cæsio-rufa, (Ach.)	153
campestris, Fr	152
castanea, Hepp	149
chlorantha, Tuckerm	151
cinnabarina, (Sommerf.)	143
coarctata, Sm., (Nyl.)	142
cuprea, (Sommerf)	143
cyrtella, (Ach., Nyl.)	148
decipiens, (Ehrh.)	142
effusa, (Smith), var. arceutina, Ach	151
flavido-livens, Tuckerm	147
flexuosa, Fries	143
Friesiana, Hepp	151
fuliginea, Ach	152
funerea, (Sommerf.)	152
fuscescens, (Sommerf.)	146

LICHENES.—*Con.*

PAGE

fusco-rubella, (Hoffm.) 150
fuscorubens, Nyl. 144
globifera, (Ach.) 141
globulosa, (Floerke.) 148
granulosa, (Ehrh.) 142
Heerii, Hepp 148
holomicra, Anz. 152
hypnophila, (Turn.) 149
icterica, Mont 142
inundata, Fr. 150
Laureri, (Hepp.) 147
leucophæa, Floerke 145
lucida, (Ach.) 147
lurida, (Sw.) 141
Macounii, Eckfeldt 152
melæna, (Nyl.) 149
micrococca, Kœrb 148
milliaria, (Fr.) 149
mixta, Fr 147
mollis, Wahl 146
moriformis, (Ach.) 151
muscorum, (Sw.) 151
Nylanderi, Anz 146
obscurata, (Sommerf.) 152
obscurella, Sommerf 152
oxyspora, (Tul.) 147
Paddensis, Tuckerm 146
pallida, (Arn.) 152
peliaspis, Tuckerm 143
rivulosa, (Ach.) 145
rubella, (Ehrh.) 150
rubiformis, (Vahl.) 141
rufo-fusca, Anz. 145
rufo-nigra, Tuckerm 141
rupestris, Scop. 151
Russellii, Tuckerm 142
russula, (Ach..) 143
sanguineo-atra, (Fr.) 144
Schweinitzii, Fr 150
scotopholis, Tuckerm 142
scrupulosa, Eckfeldt 145
sphæroides, (Dicks.) 148
stereocaulorum, (Th. Fr.) 148
suffusa, Fr. 150
testacea, Hoffm 142
Tornoensis, (Nyl.) 146
turgidula, (Fr.) 145
uliginosa, (Schrad.) 146
umbrina, (Ach.) 151
varians, (Ach.) 146
verecundula, (Th. Fr.) 149
vernalis, (Linn.) 144
var. helvola, Kœrb. 144
viridiscens, (Schrad.) 143
Bryopogon, Link 62
bicolor, (Ehrh.) 62
divergens, (Ach.) 62
Fremontii, (Tuckerm.) 64
jubata, (Linn.) var. prolixa, (Ach.) 63

LICHENES.—*Con.*

PAGE

var. chalybeiformis, (Ach.) 63
var. implexa, Fr. 63
Buellia, De Not., Tuck 161
albo-atra, (Hoffm.) 161
var. saxicola 161
alpicola, (Wahl.) 165
atrata, (Sommerf.) 163
badio-atra, (Schær.) 164
calcarea, (Weis.) 166
capitulata, Th. Fr., var. erubescens 163
colludens, Nyl 164
concreta, (Kœrb.) 166
coniopsoideum, (Hepp) 164
Copelandi, (Kœrb.), ... 166
coracina, (Hoffm.) 163
disciformis, Fr 163
empeteræa, Nyl 164
empetræum, Nyl 166
excentrica, (Nyl.) 164
geographica, (Linn.) 165
var. lecanorina, Floerke. .. 165
glaucomaria, (Nyl.) 165
lepidastra, Tuckerm 162
myriocarpa, (DC.) 163
obscurata, (Ach.) 166
Oederi, (Ach.) 165
oidalea, Tuckerm 163
papillata, (Sommerf.) 162
var. albo-cincta, Th. Fr. .. 162
parasema, (Ach.) 162
var. triphragmia, Nyl. 162
parasitula, Nyl 165
Parmeliarum, (Sommerf.) 165
pertusaricola, Willey 166
petræa, (Flot.) 164
var. grandis, Floerk 164
var. Montagnæi, Tuckerm. 164
pulchella, (Schrad.) 161
punctiformis, (Hoffm.) 163
reductum, Th. Fr. 166
Rittokensis, Hellb 164
rivularis, (Flot.) 166
rubescens, (Arn.) 166
saxatils, (Schær.) 165
scabrosa, (Ach.) 165
Schæreri, De Not 163
spuria, (Schær:) 162
urceolata, Th. Fr. 165
verruculosa, Bon 166
———————, N. Sp. 161
Calicium, De Not 171
fuscipes, Tuckerm 172
hyprellum, Ach 172
lenticulare, (Hoffm.) 171
minutum, Kœrb 172
parietinum, Ach. 173
phæocephalum, (Turn.) 171
pusillum, Floerke 173
roscidum, Floerke 172

LICHENES.—*Con.*

PAGE

salicinum, Pers. ... 172
subtile, Fr ... 172
trabinellum, Schl ... 172
trichiale, Ach ... 172
turbinatum, Pers ... 172
Coloplaca pyracea, fulmicola, DC ... 102
Cetraria, (Ach.) ... 51
aculeata, (Schreb.) ... 52
arctica, Hook ... 53
aurescens, Tuckerm ... 58
Californica, Tuckerm ... 52
chrysantha, Tuckerm ... 57
ciliaris, (Ach.) ... 55
commixta, (Nyl.) ... 55
cucullata, (Bell.) ... 54
Fahlunensis, (Linn.) ... 55
glauca, (Linn.) ... 57
var. stenophylla, Tuckerm. 57
hiascens, (Fr.) ... 54
Islandica, (Lindb.) ... 53
var. crispa, Ach ... 53
var. robusta, (Branth.) ... 54
juniperina, (Linn.) ... 58
var. terrestris, Schær ... 58
var. Pinastri, Ach ... 58
lacunosa, Ach ... 56
madreporiformis, Ach ... 52
nivalis, (Linn.) ... 54
Oakesiana, Tukerm ... 57
odontella, Ach ... 52
platyphylla, Tuckerm ... 56
ramulosa, Hook ... 52
Richardsonii, (Hook.) ... 54
sæpincola, (Ehrh.) ... 56
var. chlorophylla, Wahl. 56
tristis, (Web.) ... 51
Cladonia, Hoffm ... 126
alcicornis, (Lightf) ... 126
amaurocræa, (Flœrke) ... 136
bellidiflora, (Ach.) ... 137
Boryi, Tuckerm ... 137
Botrytis, (Hag.) ... 135
cæspiticia, (Pers.) ... 132
cariosa, (Ach.) ... 126
carniola, Fries ... 135
var. cyanipes, Sommerf. 136
cenotea, (Ach.) ... 131
chlorophæa, Floerke ... 137
Cornucopioides, (Linn) ... 137
cornuta, (Linn.) ... 130
cristatella, Tuckerm ... 139
decorticata, Floerke ... 127
deformis, (Linn.) ... 138
degenerans, Floerke ... 129
delicata, (Ehrh.) ... 132
digitata, (Linn.) ... 138
fimbriata, (Linn.) ... 128
var. radiata, Fr ... 129
var. tubæformis, Fr ... 128
Floerkeana, Fr ... 139

LICHENES.—*Con.*

PAGE

furcata, (Huds.), var. crispata, Floerke ... 132
var. pungens, Fries ... 134
var. racemosa, Floerke ... 133
var. subulata, Floerke ... 133
gracilis, (Linn.) var. verticillata, Fr ... 129
var. elongata, Fr ... 130
var. hybrida, Schær ... 129
macilenta, (Ehrh) ... 138
Mitrula, Tuckerm ... 126
multibrachiata, (Floerke.) ... 139
ochrochlora, Floerke ... 139
Papillaria, (Ehrh.) ... 131
pulchella, Schw ... 138
pycnotheliza, Nyl ... 139
pyxidata, (Linn.) ... 127
var. Pocillum, Ach ... 127
rangiferina, (Linn.) ... 134
squamosa, Hoffm ... 132
subcariosa, Nyl ... 139
sylvatica, Linn ... 134
var. alpestris, Linn ... 135
symphycarpa, Fr ... 126
turgida, (Ehrh.) ... 131
var. conspicua, (Schær.) ... 131
uncialis, (Linn.) ... 136
var. adunca, Fr ... 136
var. Caroliniana, Tuckerm. 136
var. turgescens, Fr ... 136
Collema, Hoffm ... 95
crispum, Borr ... 97
cyrtaspis, Tuckerm ... 95
flaccidum, Ach ... 97
floculosa, Nyl ... 98
furvum, (Ach.) ... 97
leptaleum, Tuckerm ... 95
limosum, Ach ... 97
melænum, Ach ... 97
var. polycarpum, Schær ... 97
multipartitum, (Sm.) ... 97
myriococcum, Ach ... 95
nigrescens, (Huds.) ... 96
pulposum, (Bernh.) ... 96
pustulatum, Ach ... 97
pycnocarpum, Nyl ... 5
tenax, (Sw.) ... 96
Coniangium ... 180
exile, Floerke ... 180
lapidicolum, Tayl ... 180
Coniocybe, Ach ... 173
furfuracea, (Linn.) ... 173
Conotrema, Tuckerm ... 121
urceolatum, (Ach.) ... 121
Endocarpon, Hedw ... 173
cinereum, Pers ... 174
fluviatile, DC ... 174
hepaticum, Ach ... 174
miniatum, (Linn.) ... 173
var. complicatum ... 173

LICHENES.—*Con.*

PAGE

var. fulvofuscum, Tuckerm 173
rufescens, Ach. 174
Ephebe, Fr. 95
pubescens, Fr. 95
Evernia, Ach. 59
divaricata, (Linn.) 59
furfuracea, (Linn.) 59
prunastri, (Linn.) 59
var. gracilis, Ach. 59
vulpina, (Linn.) 59
Graphis, Ach. 168
scripta, Ach., var. limitata, Schæer. 168
var. recta, Schær. 168
var. serpentina, Ach. 168
Gyalecta, (Ach.) 122
lutea, (Dicks.) 122
Pineti, (Schrad.) 122
rhexoblephara, (Nyl.) 122
Heterothecium, Flot 153
alpinum, Ach. 154
fuscoluteum, Dicks. 153
grossum, (Pers.) 153
leucoxanthum, (Spreng.) 154
pezizoideum, (Ach.) 153
porphyrites, Tuckerm. 154
sanguinarium, (Linn.) 153
Lecanactis, (Ehrh.) 167
abietina, (Ach.) 167
premnea, (Ach.), var. chlorococonia, Tuckerm. 167
Lecanora, Ach. 104
albescens, (Hoffm.) 108
athroocarpa, (Dub.) 110
atra, (Huds.) 108
atriseda, Nyl. 108
atrosulphurea, (Wahl.) 109
badia, (Pers.) 109
bicincta, (Ram.) 109
cæsio-cinerea, Nyl. 114
calcarea, (Linn.) 114
var. contorta, Fr. 114
castanea, (Hepp.) 111
cenisia, Ach. 113
cervina, (Pers.) 115
chlorophana, (Wahl.) 115
cinerea, (Linn.) 113
var. lævata, Fr. 114
cinereo-rufescens, Nyl. 114
detractula, (Nyl.) 116
dispersa, (Pers.) 109
effusa, Pers. 116
elatina, Ach. 111
var. minor, Tuckerm. 111
var. ochrophæa, Tuckerm. 111
epulotica, (Ach.) 114
var. subepulotica, Nyl 114
flavada, Hepp 116
frustulosa, (Dicks.) 106
fuscata, (Schrad.) 115

LICHENES.—*Con.*

PAGE

var. rufescens, Th. Fr. 116
gelida, (Linn.) 104
gibbosa, Nyl. 114
glaucocarpa, (Wahl.) 115
Hageni, Ach. 108
lacustris, (With.) 114
laxa, Branth 115
lentigera, (Web.) 104
melanaspis, (Vahl.) 113
molybdina, (Wahl.) var. vulgaris, Schær. 115
var. ereutica, Wahl. 115
muralis, (Schreb.), var. saxicola, Schær. 105
var. Garovaglii, Auz. 105
var. versicolor, Fr. 105
ochraceo-rubescens, Arnold 109
oculata, (Dicks.) 113
Pacifica, Tuckerm. 109
pallescens, (Linn.) 112
var. rosella, Tuckerm. 112
var. Upsalensis, (Linn.) 112
pallida, (Schreb.) 106
var. cancriformis, Tuckerm 106
pinniperda, (Kœrb.) 116
platycarpoides, Anzi 116
privigna, (Ach.) 116
var. pruinosa, Auctt. 116
rubina, (Vill.) 105
var. opaca, Ach. 105
Schleicheri, (Ach.) 115
sordida, (Pers.) 106
subfusca, (Linn.), var. allophana, Ach. 106
var. argentata, Ach. 107
var. atrynea, Ach. 107
var. coilocarpa, Ach. 107
var. distans, Ach. 108
var. hypnorum, Schæer. 107
var. minor, Branth. 108
symmictera, Nyl. 110
tartarea, (Linn.) 112
var. frigida, (Sw.) 113
thiodes, (Arnold,) 109
varia, (Ehrh.) 109
var. intricata, Nyl. 110
var. polytropa, Nyl. 110
var. sæpincola, Fr. 110
var. symmicta, Ach. 110
ventosa, (Linn.) 111
verrucosa, (Ach.) 113
xanthophana, (Nyl.) 115
Lecidea, (Ach.) 154
aglæa, Sommerf. 157
albocærulescens, (Wolf.) 156
var. flavocærulescens, Schær 156
alpestris, Sommerf. 159
amylacea, Ach. 157
arctica, Sommerf. 158
Armeniaca, (DC.) 157

LICHENES.—*Con.*

PAGE

aromatica, (Swartz.) ... 159
assimilata, Nyl. ... 159
atro-brunnea, (DC.) ... 156
auriculata, Th. Fr. ... 155
cæruleo-nigricans, (Lightf.) ... 154
campsteriana, Linds ... 161
candida, (Web.) ... 154
conforenda, (Nyl.) ... 160
confluens, Schær ... 156
contigua, Fr ... 156
contracta, Th. Fr. ... 160
crassipes, (Th. Fr.) ... 159
crenulata, (Dicks.) ... 159
crustulata, Ach. ... 159
cumulata, Sommerf. ... 154
Dicksonii, Ach. ... 157
Discoensis, Linds ... 160
dispansa, Nyl ... 160
distans, Eckfeldt ... 159
Egedeana. Linds ... 161
empetrea, Nyl. ... 159
enteroleuca, Fr ... 157
var. achrista, Sommerf. ... 158
var. æquata, Floerks ... 157
var. muscorum, Kœrb. ... 158
var. pilularis, DC ... 158
flavo-virescens, (Dicks.) ... 154
Friesiana, Linds) ... 161
fuscescens, Sommerf ... 157
fusco-atra, (Linn.) ... 156
fusco-rubens, Nyl. ... 160
intumescens, Floerke ... 180
Kochiana, Hepp ... 160
lapicida, (Ach.) ... 155
latypea, Ach. ... 159
limosa, Ach ... 158
melancheima, Tuckerm ... 159
Morio, Schær, var. coracina, Schær ... 159
panæola, Ach ... 155
parasema, Ach. ... 160
plana, Lahm. ... 160
planetica, Tuckerm ; var. perfecta, Eckfeldt. ... 158
polycarpa, Fr ... 155
polygonia, Flot ... 157
pruinosa, (Smith.) ... 154
pycnocarpa, Kœrb ... 158
sorediza, Nyl. ... 160
speirea, Nyl. ... 156
squalida, (Schllich.) ... 154
subfuscula, Nyl. ... 161
sylvicola, (Flot.) ... 160
synothea, Ach ... 160
tenebrosa, Flot ... 157
tessellata, Floerke ... 155
tessellina, Tuckerm ... 155
variegata, Fr ... 155
viridans, Flot ... 160
vorticosa, Hœrb ... 158

LICHENES.—*Con.*

PAGE

Leptogium, Fr ... 98
albociliatum, Desmaz ... 98
Californicum, Tuckerm ... 99
chloromelum, (Sw.) ... 100
dactylinum, Tuckerm ... 100
intermedium, Arnold ... 100
lacerum, (Sw.) ... 98
minutissimum, (Floerke.) ... 98
muscicola, (Su.) ... 98
myochroum, (Ehrh.) ... 100
palmatum, (Huds.) ... 99
pulchellum, (Ach.) ... 99
respulinum, Ach. ... 100
tenuissimum, (Dicks.) ... 98
Tremelloides, (Linn., f.) ... 99
Mycoporum, Nyl. ... 170
pycnocarpum, Nyl ... 170
Nephroma, Ach ... 85
arcticum, (Linn..) ... 85
expallidum, Nyl ... 85
Helveticum, Ach. ... 86
lævigatum, Ach ... 86
var. parile, Nyl ... 86
Lusitanicum, Schæer ... 87
tomentosum, (Hoffm.) ... 85
Normandina ... 179
lætevirens, Turn. & Borr ... 179
Omphalaria, Dur. & Mont. ... 95
phyllisca, (Wahl.) ... 95
Opegrapha, Humbolt ... 167
atra, Ach ... 167
saxicola, Ach. ... 167
varia, (Pers.), ... 167
vulgata, Ach. ... 167
zonata, Kœrb ... 167
Pannaria, Delis. ... 92
brunnea, (Sw.) ... 93
carnosa, (Dicks.) ... 94
Hookeri, (Sm.) ... 93
hypnorum, (Hoffm.) ... 92
lanuginosa, (Ach.) ... 92
lepidiota, Th. Fr. ... 94
var. coralliphora, Tuckerm. 94
leucosticta, Tuckerm ... 93
Macounii, Tuckerm ... 95
microphylla, (Sw.) ... 93
nigra, (Huds.) ... 94
plumbea, (Lightf.) ... 94
rubiginosa, (Thumb) ... 93
var. conoplea, Fr. ... 93
tryptophylla, (Ach.) ... 94
Waghornei, Eckfeldt ... 94
PARMELIACEI ... 49
Parmelia, Ach. ... 67
ambigua, (Wulf.) ... 73
var. albescens, Wahl. ... 74
Borreri, Turn ... 68
var. rudecta, Tuckerm ... 62
caperata, (Linn.) ... 72
centrifuga, (Linn.) ... 73

LICHENES.—*Con.*

PAGE

cetrata, Ach. 67
colpodes, (Ach) 71
conspersa, (Ehrh.) 72
crinita, Ach 67
encausta, (Smith) 70
var. alpicola, Nyl. 70
incurva, (Pers.) 73
lanata, (Linn.) 72
marina, E. Nyl. 76
molliuscula, Ach. 73
olivacea, (Linn.) 71
var. aspidota, Ach 71
var. panniformis, Nyl. 71
var. prolixa, Ach 71
var. sorediata, (Ach.) 71
perforata, (Jacq.) 67
perlata, (Linn.) 67
physodes, (Linn.), var. vulgaris, Kœrb. 69
var. enteromorpha, Tuckerm. 70
var. obscurata, Ach. 70
var. vittata, Ach. 70
saxatilis, (Linn.) 68
var. furfurascens, Schær 69
var. omphalodes, Fr 69
var. panniformis, (Ach.) 69
var. sulcata, Nyl. 69
stygia, (Linn.) 72
tiliacea, (Hoffm.) 68
PARMELIEI 65
Peltigera, (Willd.) 87
aphthosa, (Linn) 87
canina, (Linn.) 90
var. membranacea, (Ach.) 90
var. sorediata, Schær 91
var. spongiosa, Tuckerm 90
var. spuria, Ach 90
horizontalis, (Linn.) 88
malacea, (Ach.) 89
polydactyla, (Neck.) 88
pulverulenta, (Tayl.) 89
rufescens, (Neck.) 89
scutata, (Dicks.) 89
venosa, (Linn.) 87
Pertusaria, DC 118
ambigens, (Nyl.) 120
bryontha, (Ach.) 118
communis, DC 120
dactylina, (Ach.) 119
globularis, Ach 121
glomerata, (Ach.) 121
lactea Wulf. 121
leioplaca, (Ach.) 120
multipuncta, (Turn.) 119
panyrga, (Ach.) 119
pustulata, (Ach.) 120
rhodocarpa, Kœrb 120
velata, (Turn.) 119
Waghornei, Hulting 121

LICHENES.—*Con.*

PAGE

Wulfenii, DC 121
Physcia, (DC., Fr.) 74
adglutinata, (Floerke.) 78
aquila, (Och.), var. detonsa, Tuckerm 75
astroidea, (Fr.) 76
caesia, (Hoffm.) 76
ciliaris, (Linn.), var. crinalis, Schær 74
crispa, (Pers.) 77
hispida, (Schreb.) 76
var. leptalea, Ach 76
hypoleuca, (Muhl.) 74
leuconiela, (Linn.) 74
obscura, (Ehrh.) 77
var. endochrysea, Nyl. 77
pulverulenta, (Schreb.) 75
var. leucoleiptes, Tuckerm. 75
var. muscigena, Schreb. 75
scopularis, Nyl. 179
setosa, (Ach.) 77
speciosa, (Wulf.) 74
stellaris, (Linn.) 75
var. aipolia, Nyl. 76
tribacia, (Ach.) 77
Physma, Mass 92
luridum, (Mont,) 92
Piolphorus, Th. Fr 125
cerelous, (Ach.,) var. Fibula, Tuckerm 125
var. acicularis, Tuckerm 125
var. robustus, Tuckerm 125
clavata, Fries 125
Placodium, (DC.) 101
aurantiacum, (Lightf.) 102
cerinum, (Hedw:) 102
var. pyracea, Nyl 102
var. pyracea, Nyl., f: ulmicole, DC 102
cirrochroum, (Ach.) 101
crenulatum, (Wahlenb.) 104
elegans, (Link.) 101
var. trachyphyilum, Tuckerm 101
ferrugineum, (Huds.) 103
var. discolor, Willey 103
fulgens, (Sw.) 101
jungermanniæ, (Vahl.) 103
murorum, (Hoffm.) 101
nivale, (Kœrb.) 103
rupestre, (Scop.) 102
sinapispermum, (Auct.) 103
tetraspora, (Nyl.) 103
variabile, (Pers.) 104
vitellinum, (Ehrh.) 104
var. aurellum, Ach. 104
var. octosporum, Nyl. 104
Pycnides 179
verisimilide, Branth 179
Pyrenula, (Ach.) 177

LICHENES.—*Con.*

PAGE

cinerella, (Flot.) ... 178
fallacia, Eckfeldt ... 178
gemmata, (Ach.) ... 178
glabrata, Ach ... 179
hyalospora, (Nyl.) ... 178
lactea, Mass ... 179
leucoplaca, (Walh.) ... 178
mamillana, (Ach.) ... 178
nitida, Ach ... 178
nitidella, Mull ... 179
patallaræformis, Eckfeldt ... 178
pithyophila, Th. Fr ... 178
punctiformis, (Ach,) ... 177
thelæna, (Ach.) ... 177
Pyxine, Fr ... 78
sorediata, Fr ... 78
Ramalina, Ach ... 49
calicaris, (Linn.), var. fraxinea, Fr ... 49
var. canaliculata, Fr. ... 50
var. farinacea, Schær ... 50
var. fastigiata, (Pers.) ... 49
cuspidata, Ach ... 51
dilacerta, Hoffm ... 50
minuscula, Nyl ... 51
minuscula, f. pollinariella, Nyl. 51
pollinaria, (Westr.) ... 51
polymorpha, Ach ... 51
pusilla, (Prev.), var. *geniculata*, Tuckerm ... 50
reticulata, (Nochd.) ... 49
Rinodina, Mass ... 116
Ascociscana, Tuckerm ... 117
constans, (Nyl,) ... 118
nimbosa, (Fr.) ... 116
oreina, (Ach.) ... 117
pyrina, Ach ... 179
sophodes, (Ach.) ... 117
var. atrocinerea, Nyl ... 179
var. confragosa, Nyl ... 118
var. exigua, Fr ... 118
succedens, Nyl ... 117
teichophila, Nyl ... 117
turfacea, (Wahl.) ... 117
var. mniaræa, Nyl ... 117
Sagedia, Mass ... 175
carpinea, Pers ... 175
Cestrensis, Tuckerm ... 175
oxyspora, (Nyl.) ... 175
Scoliciosporum ... 161
psotimum, (Fr.) ... 161
Secoliga ... 180
Friesii, Flot ... 180
Segestria, Fries ... 174
majusculum, Nyl ... 174
Siphula, Fries ... 170
ceratites, Nyl ... 170
Solorina, Ach ... 91
crocea, (Linn.) ... 91
saccata, (Linn.) ... 91

LICHENES.—*Con.*

PAGE

var. spongiosa, Nyl ... 92
Sphærophorus, Pers ... 170
compressum, Ach ... 171
fragile, (Linn.) ... 171
globiferous, (Linn.) ... 170
Staurothele, Norm ... 174
Drummondii, Tuckerm ... 174
umbrina, (Wahl.) ... 174
Stereocaulon, Schreb ... 123
condensatum, Hoffm ... 124
coralloides, Fr ... 123
denudatum, (Floerke) ... 124
nanodes, Tuckerm ... 125
nanum, Ach ... 125
paschale, (Linn.) ... 123
pileatum, (Ach.) ... 124
tomentosum, (Fr.) ... 123
var. alpinum, Th. Fr ... 124
Wrightii, Tuckerm ... 125
Sticta, (Schreb.) ... 82
amplissima, (Scop.) ... 82
anthraspis, Ach ... 84
aurata, (Smith.) ... 83
crocata, (Linn.) ... 84
fuliginosa, (Dicks.) ... 84
herbacea, (Huds.) ... 83
limbata, (Smith.) ... 84
Oregana, Tuckerm ... 84
pulmonaria, (Linn.) ... 83
var. linita, Nyl ... 83
quercizans, (Michx.) ... 84
scorbiculata, (Scop.) ... 85
Thamnolia, (Ach.) ... 139
vermicularis, (Sw.) ... 139
Theloschistes, Norm ... 65
chrysophthalmus, (Linn.) ... 65
var. flavicans, Wallr, ... 65
concolor, (Dicks.) ... 66
lychneus, (Nyl.) ... 66
parietinus, (Linn.) ... 65
polycarpus, (Ehrh.) ... 66
Thelotrema, (Och,) ... 122
lepadinum, (Ach.) ... 122
subtile, (Tuckerm.) ... 123
Trypethelium, Spreng ... 174
virens, Tuckerm ... 174
Umbilicaria, Hoffm ... 78
angulata, Tuckerm ... 82
anthracina, (Wulf.) ... 79
var. reticulata, Schær ... 79
cylindrica, (Linn.) ... 78
Dillenii, Tuckerm ... 81
erosa, (Web.) ... 80
flocculosa, Hoffm ... 80
hirsuta, (Ach.), var. grisea, Fr. 82
hyperborea, Hoffm ... 80
Muhlenbergii, (Ach.) ... 81
Pennsylvanica, Hoffm ... 82
phæa, Tuckerm ... 80
polyphylla, (Linn.) ... 79

LICHENES.—*Con.*

PAGE

var. deusta, (Linn.) 79
proboscidea, (Linn.) 79
var. arctica, (Ach.) 79
pustulata, (Linn.) var. papulosa, Tuckerm 82
rugifera, (Nyl.) 78
spodochroa, Hoffm. 82
vellea, (Linn.) 81
UMBILICARIEI 78
Urceolaria, Tuckerm 122
scruposa, (Linn.) 122
Urophora funera, (Sommerf.) 152
Usnea, Dill 60
angulata, Ach. 61
barbata, (Linn.), var. florida, Fries 60
var. articulata, Ach 61
var. ceratina, Schær 61
var. dasypoga, Fr 61
var. hirta, Fr. 60
var. hirtella, Arn. 61
var. plicata, Fr. 61
var. rubiginea, Michx. 60
cavernosa, Tuckerm 62
longissima, Ach 62
sulphurea, (Müll.) 60
trichodea, Ach? 62
USNEEI 49
Verrucaria, Pers 175
amylacea, Hepp 176
aquatilis, Mudd 177
brachyspora, Arnold 177
bryophila, Lorm 176
centhocarpa, Wahl 175
chlorotica, Act 177
dolosa, Hepp 177
epidermidis, *f.* punctiformis, Branth 177
epigæa, (Pers.) 175
intercedens, Nyl. 176
intermedia, (Th. Fr.) 176
maura, (Wahl.) 175
microloba, Tuckerm 176
Nepigona, Tuckerm 176
nigrescens, Pers 175
nigricola, Arnold 176
Nylanderi, Hepp 176
pachyderma, Arnold 177
papillosa, Floerke 177
rimosicola, Leight 176
rupestris, Schrad 176
terrestris, Th. Fr. 176
theliodes, Sommerf. 176
Xylographa, Fries 167
Opegraphella, Nyl 168
parallela, (Ach.) 167

MUSCI.

Amblystegium, Schimp 300
adnatum, (Hedw.) 302

MUSCI.—*Con.*

PAGE

compactum, (C. Muell.) 302
curvipes, Grumb. 302
fluviatile, Bruch & Schimp. 302
Kochii, Bruch & Schimp 302
Lescurii, Sulliv 302
minutissimum, Sulliv. & Lesq. 300
orthocladon, (Beauv.) 302
porphyrhizon, (Lindb) 301
pseudo-confervoides, Kindb. 301
serpens, var. subenerve, Ren. & Card 301
speirophyllum, Kindb 301
Sprucei, Bruch & Schimp 301
subtile, Bruch & Schimp 301
varium, Hedw 301
Amphoridium, Schimp 226
Californicum, Lesq. & James . 226
crispatus, Kindb 226
Lapponicum, Schimp 226
subsp. decipiens, Kindb. 226
Mougeotii, Schimp 226
Sullivantii, Lesq. & James 227
Andreæa, Ehrhart 184
crassinervis, Bruch 184
obtusifolia, Berggren 185
petrophila, Ehrh 184
var. acuminata, Schimp .. 184
var. papillosa, Lindb 184
var. parvifolia, (Mull.) 184
subsp. sublævis, Kindb. 184
Rothii, Web. & Mohr., subsp. falcata, Schimp 184
Ancectangium, Schw 186
Canadense, Kindb 186
compactum, Schw 186
Anomodon, Hook. & Taylor 274
apiculatus, Bruch & Schimp. 274
glabellus, Kindb 274
heteroideus, C. M. & Kindb. 274
Moseri, Kindb 274
obtusifolius 274
platyphyllus, Kindb 274
subrigidulus, Kindb 275
tectorum, Al. Braun 275
viticulosus, (Linn.) 274
Antitrichia, Brid 271
Californica, Sulliv 271
curtipendula, Brid., var. *gigantea* 271
gigantea, (Sulliv. & Lesq.) 271
Atrichum, Beauv 262
angustatum, Bruch & Schimp. . 262
Haussknechtii, Juratzka & Milde 263
leiophyllum, Kindb 263
Selwyni, Aust 262
undulatum, Beauv 262
Aulacomnium, Schwaegr 260
androgynum, Schwaegr 260
palustre, Schwaegr 261
var. inbricatum, Bruch & Schimp 261

MUSCI.—*Con.*

PAGE

turgidum, Schwaegr.... 261
Barbula, Hedw..... 212
aciphylla, Bruch & Schimp.... 214
brachyphylla, Sulliv., var. angustifolia, Kindb..... 213
brevirostris, Bruch & Schimp.. 212
cæspitosa, Schwaegr... 212
chysopoda, C. M. & Kindb.... 213
circinnatula, C. M. & Kindb... 213
convoluta, Hedw 213
fallax, Hedw..... 212
fragilis, (Drumm.)..... 212
horridifolia, C. M. & Kindb.... 213
inclinatula, C. M. & Kindb.... 212
lævipila, Bruch & Schimp..... 215
læviuscula, Kindb..... 215
megalocarpa, Kindb..... 214
mucronifolia, Bruch & Schimp. 214
papillinervis, C. M. & Kindb.. 215
pseudo-aciphylla, Kindb..... 214
recurvifolia, Schimp..... 212
ruralis, (Linn.)..... 214
spadicea, Mitt..... 213
subcuneifolia, Kindb..... 215
submegalocarpa, Kindb..... 214
subulata, (Linn.)..... 214
tortuosa, (Linn.)..... 212
unguiculata, (Huds.)..... 213
vinealis, Braun..... 215
Waghornei, Kindb..... 215
Bartramia, Hedw..... 239
breviseta, Lindb., subsp. rigidula, Kindb..... 240
crispa, Swartz..... 239
glauco-viridis, C. M. & Kindb.. 239
ithyphylla, Brid..... 239
Œderi, (Gunner).. 239
pomiformis, Hedw..... 239
pomiformis, var. *crispa*, Schimp. 239
radicalis, Beauv..... 241
subulata, Bruch & Schimp..... 239
viridissima, Brid..... 239
Blindia, Bruch & Schimp..... 206
acuta, (Huds.)..... 206
flexipes, (Ren. & Card.)..... 206
Brachtrythecium, Schimp..... 286
acuminatum, var. *cyrtophyllum*. 287
albicans, Bruch & Schimp. 288
biventrosum., Muell..... 290
calicareum, Kindb..... 290
campestre, Bruch & Schimp.... 289
cavernosum, Kindb. 290
cirrhosum, Schwaegr..... 291
cyrtophyllum, Kindb..... 287
digastrum, C. M. & Kindb..... 287
erythrorrhizon, Bruch & Schimp 291
glareosum, Bruch..... 287
harpidoides, C. M. & Kindb.... 288
Hillebrandi, Lesq..... 290
Idahense, Ren. & Card..... 288

MUSCI.—*Con.*

PAGE

intricatum, Hedw 290
lætum, Brid..... 286
lævisetum, Kindb..... 288
œdipodium, Mitt..... 288
petrophyllum, R. S. Williams.. 291
plumosum, Bruch & Schimp.... 289
populeum, Bruch & Schimp.... 289
reflexum, (Stark.)..... 288
var. Demetrii, (Ren. & Card.)..... 289
rivulare, Bruch & Schimp..... 289
rutabulum, Bruch & Schimp. .. 289
salebrosum, Bruch & Schimp.... 287
var. densum, Bruch & Schimp..... 287
var. Waghornei, Ren. & Card..... 287
spurio-rutabulum, C. M. & Kindb..... 289
Starkei, Bruch & Schimp..... 288
subglaciale (Kindb.). 287
subintricatum, Kindb. 290
velutinum, Bruch & Schimp.... 288
Bryobrittonia, R. S. Williams..... 215
pellucida, R. S. Williams..... 216
Bryum, Dill.. 246
aciculinum, Kindb 252
acutiusculum, C. Muell..... 254
affine, Bruch. 254
Alaskanum, Kindb..... 247
albicans, Wahlenberg. 246
arcticum, Bruch & Schimp..... 246
bimum, Schreber..... 248
var. atrotheca, Ren. & Card. 248
bullatum, C. Muell..... 254
cæspiticium, Linn 249
capillare, Linn.. 249
subsp. erythroloma, Kindb. 250
subsp. ruraliforme, Kindb. 249
capitellatum, C. M. & Kindb.. 249
carneum, Linn..... 245
compactum, Hornschuch 247
conditum, R. S. Williams..... 247
crudum, Linn..... 245
cuspidatum, Schimp..... 247
Dawsonense, R. S. Williams... 246
Donii, Greville 250
subsp. obconicum, Hornsch 250
Duvalii, Voit..... 250
extenuatum, Pen. & Card..... 253
Ferchelii, Funch..... 254
flagellosum, Kindb..... 252
Froudei, Kindb..... 248
gemmascens, Kindb..... 253
gemmuligerum, Kindb..... 254
globosum, Lindberg 254
grandirete, Kindb..... 252
Hendersoni, Ren. & Card..... 253
inclinatum, Bruch & Schimp... 247
Knowltoni, Barnes..... 249

MUSCI.—*Con.*

PAGE

lapponicum, Kaurin, subsp. subinclinatum, Kindb..... 248
Lescurii, Sulliv..... 245
leucolomatum, C.M. & Kindb.. 248
longisetum, Bland..... 247
micans, Limpricht..... 248
microsporum, Kindb..... 244
miscrostegioides, Kindb..... 254
Muehlenbeckii, Kindb..... 249
nutans, Schreb..... 243
nutans, subsp. *canaliculatum*, C. M. & Kindb..... 244
occidentale, Sulliv..... 254
Oreganum, Sulliv..... 252
Oreganum, Sulliv..... 249
pallens, Swartz..... 250
pallescens, Schleicher..... 248
pendulum, (Hornsch.)..... 246
polymorphum, Hoppe & Hornsch, subsp. brachycarpum, Hoppe & Hornsch..... 244
producticolle, Kindb..... 253
pseudotriquetum, Schwaegr.... 250
var. compactum, B. & S.. 251
var. hyalodontium, C. M. & Kindb..... 251
purpurascens, Bruch & Schimp., subsp., autumnale, Limpricht..... 246
Raui, Austin..... 249
Revelstokense, Kindb..... 251
Rœllii, Philibert..... 247
Sawyeri, Ren. & Card..... 253
Schimperi, C. Muell..... 245
simplex, Kindb..... 255
speirophyllum, Kindb..... 250
streptophyllum, Kindb..... 252
submuticum, Philibert..... 251
suborbiculare, Philibert..... 251
synoico-cæspiticium, C. M. & Kindb..... 249
tomentosum, Kindb..... 253
torquescens, Br. & Sch..... 251
trichophorum, Kindb..... 252
ventricosum, Dickson..... 250
Buxbaumia, Hall..... 267
indusiata, Bridel..... 267
Calliergon, Lesq. & James..... 316
Campothecium, Schimp..... 286
arenarium, Lesq..... 286
lutescens, Bruch & Schimp.... 286
nitens, (Schreb.)..... 286
Nuttallii, Bruch & Schimp..... 286
pinnatifidum, Sulliv. & Lesq... 286
Campylium, Linn..... 302
striatellum, Kindb..... 299
Campylopus, Brid..... 202
Schimperi, Milde..... 202
Catharinea augustata, Brid..... 262
Selwyni, Austin..... 262

MUSCI.—*Con.*

PAGE

undulata, (Linn.)..... 262
Catharinella atrovirens, Mitt..... 264
contorta, Menzies..... 263
Catoscopium, Brid..... 242
nigritum, (Hedw.)..... 242
Ceratodon, Brid..... 205
Columbiæ, Kindb..... 205
conicus, Hampe..... 205
purpureus, Brid..... 205
Cinclidium, Swartz..... 260
Macounii, Kindb..... 260
stygium, Swartz..... 260
subrotundum, Lindb..... 260
Cirriphyllum cirrhosum, (Schwaegr). 291
Claopodium leuconeuron, (S. & L.) . 285
pellucinerve, (Mitt.)..... 285
Whippleanum, (Sulliv.)..... 284
Climacium, Web. & Mohr..... 278
Americanum, Brid..... 278
dendroides, Web. & Mohr..... 278
var. Oregonense, Ren. & Card..... 278
Ruthenicum, (Weinm.)..... 278
Conostomum, Swartz..... 240
boreale, Swartz..... 240
Coscinodon calyptratus, Hook..... 221
Cratoneuron, Sulliv..... 307
Ctenidium, Hedw..... 308
Ctenium, Sulliv..... 308
Cynodontium, Schimp..... 188
polycarpum, Schimp..... 188
subsp. fallax, Limpr..... 188
Schisti, (Wahlb.)..... 188
strumiferum, Ehrh..... 188
torquescens, (Bruch)..... 188
virens, Schimp..... 188
Wahlenbergii, (Brid.)..... 189
Desmatodon, Brid..... 211
cernuus, Bruch & Schimp..... 211
latifolius, Brid..... 211
var. glacialis, Schimp..... 211
Porteri, James..... 211
systilioides, Ren. & Card..... 211
Systylius, Bruch & Schimp.... 211
Dichelyma, Myrin..... 269
capillaceum, var. *elongatum*, Kindb..... 269
falcatum, (Hedw.)..... 269
obtusulum, Kindb..... 269
pallescens, Bryol..... 269
Dichodontium, Schimp..... 189
flavescens, (Dicks.)..... 189
pellucidum, Schimp..... 189
subsp. fagimotanum, Braith 189
subflavescens, Kindb..... 189
Dicranella, Schimp..... 190
cerviculata, Schimp..... 191
cerviculatula, Kindb..... 191
crispa, (Elph.)..... 190
Grevilleana, Schimp..... 190

MUSCI.—*Con.*

PAGE

heteromalla, Schimp..... 192
polaris, Kindb..... 191
squarrosa. Starke..... 190
subulata (Hedw.)..... 191
varia, (Hedw.)..... 191
Dicranodontium, Bruch & Schimp.. 202
longirostre, Bruch & Schimp.... 202
Dicranoweisia, Lindb..... 187
cirrhata, Lindb..... 187
contermina, Ren. & Card..... 187
crispula, (Hedw.)..... 187
obliqua, Kindb..... 187
Dicranum, Hedw..... 192
algidum, Kindb..... 198
angustum, Lindb..... 200
Bergerii, Bland..... 201
subsp. rupincola, Kindb... 201
Blyttii, Bruch & Schimp..... 192
Bonjeani, De Not..... 200
camptophyllum, Kindb..... 198
var. poriferum, Kindb 198
Canadense, Kindb..... 198
condensatum, Hedw..... 202
congestum, Brid..... 196
consobrinum, Ren. & Card..... 195
crispulum, C. M. & Kindb..... 195
Demetrii, Ren. & Card..... 196
Drummondii, C. Muell..... 201
elongatum, Schw..... 199
subsp. attenuatum, Kindb. 199
subsp. subfragilifolium, Kindb. 199
falcatum, Hedw..... 192
flagellare, Hedw..... 193
fragilifolium, Lindb..... 199
fulvellum, (Dicks.)..... 192
fulvum, Hook 193
fuscescens, Turn..... 196
subsp., subbrevifolium, Kindb 196
Grœnlandicum, Brid..... 194
Howellii, Ren. & Card..... 194
subsp. angustifolium, Kindb 194
longifolium, Hedw. 200
var. subalpinum, Milde.... 200
majus, Smith..... 195
var. orthophyllum, Al. Br. 195
molle, Wils..... 192
montanum, Hedw..... 193
Muehlenbeckii, Bruch & Schimp 197
pallidum, Bruch & Schimp.... 201
pumilum, Sauter..... 192
Rœllii, Kindb..... 200
scoparium, Hedw..... 195
subsp. involutum, Kindb.. 195
serratum, Kindb..... 193
spadiceum, Zett..... 202
Sphagni, Wahlenberg..... 202
spurium, Hedw..... 202
Starkei, Web. & Mohr..... 192

MUSCI.—*Con.*

PAGE

strictum, Schleich..... 193
subpalustre, C. M. & Kindb. . 201
subspadiceum, Kindb..... 199
subulifolium, Kindb..... 194
sulcatum, Kindb..... 194
trachyphyllum, Ren. & Card.... 197
undulatum, Durn..... 201
subsp. Ontariense, Kindb.. 202
viride, Schimp..... 193
var. læve, Ren. & Card. .. 193
Didymodon, Hedw..... 207
Canadense, Kindb..... 207
luridus, Hornsch..... 207
rubellus, (Hoffm.)..... 207
subruber, Kindb 207
trachyneuron, Kindb 207
Diphyscium, Mohr 266
foliosum, Mohr 266
sessile, Schmid..... 266
Dissodon, Grev. & Arn..... 236
Frœlichii, (Hedwig.)..... 236
splachnoides, (Thunb.)..... 237
Distichium, Bruch & Schimp 206
capillaceum, (Swartz.)..... 206
inclinatum. (Ehrh.)..... 206
Ditrichum, Timm..... 208
elatum, Kindb 209
flexicaule, (Schleich.)..... 209
subsp. densum, (Schimp.).. 209
giganteum, R. S. Williams.... 208
glaucescens, (Hedw.)..... 210
homomallum, (Hedw.)..... 209
oblongum, (Lindb.)..... 208
pallidum, (Schroeder.)..... 209
Schimperi, Lesq..... 209
suboblongum, Kindb..... 209
tortile, (Gmel.)..... 208
subsp. pusillum, Hedw.... 208
vaginans, (Sulliv.)..... 209
Drepanium, C. Muell..... 308
Drummondia, Hook 227
Canadensis, Kindb..... 227
clavellata, Hook, var. *Canadensis*, Kindb 227
Elodium, Sulliv..... 286
paludosum, Sulliv..... 286
Encalypta, Schreb..... 234
alpina, Smith..... 234
commutata, Nees & Hornsch. . 234
contorta, (Wulfen)..... 235
Labradorica, Kindb. 235
longipes, Mitten 235
rhabdocarpa, Schwaegr..... 234
Selwyni, Aust..... 235
streptocarpa, Hedw 235
sub-brevicolla, Kindb..... 233
subspathulata, C. M. & Kindb.. 235
Entodon, Muell..... 277
Macounii, C. M. & Kindb..... 277
orthocarpus, (La Pyl.)..... 278

MUSCI.—*Con.*

	PAGE
seductrix, Hedw	277
Sullivantii, C. Muell	278
Eucladium, Bryol	186
verticillatum, Bryol	186
Eurhynchium, Schimp	294
acutifolium, Kindb	296
glaciale, Br. Eur	296
gramincolor, Brid	294
hians, (Hedw.)	294
Labradoricum, Kindb	296
Macounii, Kindb	296
pseudo-velutinoides, Kindb	295
reflexum, Starke	288
scabridum, Lindb	295
semiasperum, C. M. & Kindb	295
Stokesii, (Turn.)	294
subsp. pseudo-speciosum, Kindb	294
strigosum, (Hoffm.)	294
subsp. præcox, Hedw	294
subcæspitosum, Kindb	295
subscabridum, Kindb	295
Sullivantii, (Spruce.)	294
Fabronia, Raddi	272
Ravenelii, Sulliv	272
Fissidens, Hedw	203
adiantoides, Linn., var. cristatus, Wilson	204
adiantoides, Linn	203
var. immarginatus, Lindb	203
var. instatus, Kindb	204
bryoides, Hedw	203
var. viridulus, Swartz	203
decipiens, De Not	204
Garberi, Lesq. & James	204
grandifrons, Brid	204
incurvus, Schwaegr	203
limbatus, Sulliv	203
osmundoides, (Sw.)	203
Ravenelii, Sulliv	204
subbasilaris, Hedw	204
Fontinalis, Dill	267
biformis, Sulliv	267
Dalecarlica, Schimp	267
disticha, Hook. & Wils	268
gigantea, Sulliv	267
hypnoides, Hartm	268
Kindbergii, Ren. & Card	267
Lescurii, Sulliv	268
Neo-Mexicana, Sulliv. & Lesq	267
nitida, Lindb. & Arn	269
Novæ-Angliæ, Sulliv	268
subsp. involuta, Ren. & Card	268
seriata, Lindb	286
squamosa, Linn	268
subsp. Delamarie, Ren. & Card	268
squamosa, Linn	268
Fossfræmia trichomitria, Hedw	269

MUSCI.—*Con.*

	PAGE
Funaria, Schreb	238
calcarea, Wahl	238
hygrometrica, Sibth	238
var. arctica, Berggren	238
Georgia, Ehrh	236
cuspidata, Kindb	236
geniculata, (Girgens.)	236
pellucida, (Linn.)	236
trachypoda, Kindb	236
Grimmia, Ehrh	217
alpicola, Swartz	218
ambigua, Sulliv	219
anodon, Bruch & Schimp	219
apocarpa, Hedw	217
arctophyla, Kindb	221
subsp. labradorica, Kindb	221
Californica, Sulliv	222
calyptrata, Hook	221
Canadensis, Kindb	220
canescens, (Timm.)	224
chloroblasta, Kindb	218
commutata, Hueben	221
compacta, Kindb	222
conferta, Funck	217
depilata, Kindb	220
fascicularis, (Schrad.)	223
gracilis, Schleicher	217
heterosticha, (Hiotro.)	223
heterophylla, Kindb	218
hypnoides, (Linn.)	224
mannia	217
microcarpa, Hedw	223
microtricha, C. M. & Kindb	221
nivalis, Kindb	219
ortholoma, Kindb	222
ovata, Web. & Mohr	221
plagiopodia, Hedw	219
subsp. Brandegei, (Austin.)	219
plagiopodia var. *pilifera*, Lesq. & James	219
platyphylla, Mitten	218
procera, Kindb	220
prolifera, C. M. & Kindb	219
pruinosa, Wilson	219
pseudo-rivularis, Kindb	218
subsp. lancifolia, Kindb	218
ramulosa, Lindb	223
rivularis, Nees & Hornsch	218
robustifolia, Kindb	223
subflaccida, Kindb	222
tenerrima, Ren. & Card	219
tenuicaulis, R. S. Williams	221
teretinervis, Limpricht	221
torquata, Hornsch	220
tortifolia, Kindb., subsp. pellucida, Kindb	220
velutina, Kindb	217
Gymnostomum, Hedw	185
calcarea, Nees & Hornsch	185
curvirostris, Ehrh	

MUSCI.—*Con.*

PAGE

var. commutatum, Card. & Ther 185
pusilla, Kindb..... 186
rupestris, Schleich..... 185
tenue, Schrad..... 185
Haplodon Wormskioldii, (Hornem.) 237
Harpidium, Lesq. & James..... 303
Hedwigia, Ehrh..... 225
albicans, (Weber.)..... 225
var. leucophæa, Schimp.. 225
var. subnuda, Kindb..... 225
ciliata, Ehrh..... 225
Heterocladium, Bruch & Schimp... 280
aberrans, Ren. & Card..... 282
dimorphum, Br. Eur..... 280
heteropterioides, Best..... 282
var. filescens, Best..... 283
heteropterum.....281, 282, 283
Macounii, Best..... 281
procurrens, (Mitt.)..... 282
squarrosulum, (Voit.)..... 280
Homalia, Brid..... 270
Jamesii, Schimp..... 270
Macounii, C. M. & Kindb..... 270
Homalothecium, Bruch & Schimp.. 277
sericeoides, C. M. & Kindb.... 277
sericeum, Linn..... 277
Hylocomium, Schimp..... 317
breviostre, (Ehrh.)..... 317
loreum, (Linn.)..... 318
proliferum, Linn..... 317
pyrenaicum, (Spruce)..... 317
robustum, (Hook.)..... 318
splendens, (Hedw.)..... 317
squarrosum, Linn..... 318
triquetrum, (Linn.)..... 318
umbratum, (Ehrh.)..... 317
Hypnum, Linn..... 302
aduncum, Linn..... 303
Alaskæ, Kindb..... 308
alpestré, Swartz..... 314
alpinum, Schimp..... 314
amblyphyllum, R. S. Williams. 306
badium, Hartm..... 315
Bambergeri, Schimp..... 304
Bestii, Ren. & Bryhn..... 314
brevifolium, Lindb..... 304
Canariense, Mitt..... 309
chloropterum, C. M. & Kindb.. 307
chrysophyllum, Brid..... 303
circinale, Hook..... 311
commutatum, Hedw., subsp. sulcatum, Schimp..... 307
conflatum, C. M. & Kindb..... 306
cordifolium, Hedw..... 316
Cossoni, Schimp..... 304
crista-castrensis, Linn..... 308
cupressiforme, Linn..... 312
var. brevisetum, Schimp. 312
var. resupinatum, Schimp.. 312

MUSCI.—*Con.*

PAGE

curvifolium, Hedw..... 313
cuspidatum, Linn..... 317
decipiens, (De Not.) 307
dilatatum, Wils..... 314
eugyrium, Schimp..... 315
exannulatum, Guembel..... 305
subsp. pseudo-lycopodioides, Kindb..... 305
subsp. pseudo-stramineum, Kindb..... 305
falcatum, Brid..... 307
fastigiatum, Brid. 309
fertile, Sendt..... 309
filicinum, Linn..... 307
filiforme, Kindb..... 313
Fitzgeraldi, Renauld. Kindb... 303
fluitans, Linn 305
giganteum, Schimp..... 316
var. Labradorense, Ren. & Card..... 316
hamulosiforme, Kindb..... 314
hamulosum, Bruch & Schimp.. 309
hispidulum, Brid..... 302
implexum, Ren. & Card. 309
imponens, Hedw..... 311
Lindbergii, Mitt..... 312
var. elatum, Schimp..... 312
longinerve, Kindb..... 306
Macounii, Kindb..... 303
molluscoides, Kindb..... 308
Moseri, Kindb..... 306
nemorosum, Koch..... 313
Novæ-Angliæ, Sulliv. & Lesq... 307
occidentalis, S. & L..... 283
ochraceum, Turner..... 315
orbicularicordatum, Ren.& Card 310
orthothecioides, Lindb..... 306
pallescens, Schimp..... 309
palustre, Huds..... 314
perichætiale, Kindb..... 309
plicatile, (Mitt.)..... 311
polare, Lindb..... 314
polygamum, (Bruch & Schimp.) 303
pratense, Koch..... 313
pseudo-complexum, Kindb 313
pseudo-montanum, Kindb..... 314
pseudo-nemorosum, Kindb.... 313
pseudo-recurvans, Kindb..... 312
reptile, Michx..... 309
reptiliforme, Kindb..... 308
revolutum, (Mitt.)..... 311
revolvens, Swartz..... 304
Richardsonî, (Mitt.)..... 316
rugosum, Linn..... 308
sarmentosum, Wahl..... 316
var. fontinaloides, Berggren 316
Schreberi, Willd..... 317
scorpioides, Linn..... 315
var. gracilescens, Sanio.... 315
Sendtneri, Schimp..... 304

MUSCI.—*Con.*

PAGE

Sequoieti, C. Muell. 311
sinuolatum, Kindb. 303
stellatum, Schreb. 303
stramineum, Dicks. 315
subcomplexum, Kindb. 313
subeugyrium, Ren. & Card. 310
subgiganteum, Kindb. 317
subimponens, Lesq. 311
subplicatile, (Lindb.) 311
subsecundum, Kindb 304
turgescens, (Jensen) 315
var. uliginosum, Lindb. 315
uncinatum, Hedw. 305
var. micropterum, Kindb. 305
var. plumulosum, Schimp. 306
var. subsymmetica, (Card.) 306
Vaucheri, Lesq. 312
vernicosum, Lindb. 304
Waghornei, Kindb 309
Wilsoni, Schimp 304
Hypopterygium, Bridei 271
Canadense, Kindb. 271
Isothecium, Brid. 292
brachycladon, Kindb. 292
hylocomioides, Kindb. 293
obtusatulum, Kindb. 293
thamnioides, Kindb. 293
Leersia rhabdocarpa, (Schwæg.) 234
Selwyni, (Aust.) 235
Leptobryum, Schimp. 243
pyriforme, Schimp. 243
Leptodon, Mohr. 269
trichomitrium, Mohr. 269
Leptodontium, Hampe. 208
Canadensis, Kindb 208
Leptotrichum, Hampe. 208
flexicaule, var. *brevifolium*, Kindb 209
Schimperi, Lesq. 209
tomentosum, Kindb. 202
Lescuræa, Schimp. 273
frigida, Kindb. 273
Leskea, Hedw. 272
intermedia, Best. 273
nervosa, Myrin., var. balbifera, (Brid.) 273
obscura, Hedw 273
polycarpa, Ehrh., var. paludosa, (Hedw.) 272
pulvinata, Wahl. 273
subobtusifolia, C. M. & Kindb. 273
Wollei, Aust. 273
Leucobryum, Hampe. 204
vulgare, Hampe. 204
Leucolepis acanthoneura, Schw. 260
Limnobium, Bruch & Schimp. 314
Lindbergia brachyptera, Mitt. 271
Macouniella Californica, Sulliv. 271
Meesia, Hedw. 242
Albertinii, Bruch & Schimp. 242

MUSCI.—*Con.*

PAGE

trichodes, (Linn) 242
triquetra, (Linn.) 242
tristicha, Bruch & Schimp. 242
uliginosa, Hedw. 242
Mnium, Linn. 255
affine, Bland. 256
arcticum, Kindb. 260
Blyttii, Bruch & Schimp. 258
ciliare, Greville. 256
cinclidioides, Heuben. 258
Drummondii, Bruch & Schimp. 256
glabrescens, Kindb. 259
subsp. chlorphyllosum, Kindb. 259
hornum, Linn. 257
hymenophylloides, Heuben. 259
hymenophyllum, Bryol. Eur. 259
inclinatum, Lindb. 258
insigne var. *intermedium*, Kindb. 257
macrociliare, C. M. & Kindb. 256
marginatum, Dicks. 257
medium, Bruch & Schimp. 256
Menziesii, C. Muell. 260
orthorhynchum, Bruch&Schimp 257
pseudo-lycopodioides, C. M. & Kindb. 257
punctatum, Hedw. 258
riparium, Mitten. 260
robustum, Kindb. 257
rostratum, Schwægr. 256
rugicum, Lauwr. 257
serratum, Brid. 257
spinulosum, Bruch & Schimp. 258
stellare, Hedw. 258
subglobosum, Bruch & Schimp. 259
umbratile, Mitt. 258
venustum, Mitt. 255
Myurella, Bruch & Schimp. 272
apiculata, Bruch & Schimp. 272
Careyana, Sulliv. 272
gracilis, Weinmann. 272
julacea, (Vill.) 272
tenerrima, Brid. 272
Neckera, Hedw. 269
complanata, (Linn.) 270
Douglasii, Hook. 270
Jamesii, Schimp. 270
Macounii, C. M. & Kindb. 270
Menziesii, Drumm. 269
oligocarpa, Bruch 270
oligocarpa pterantha 270
pennata, (Linn.) 269
pterantha, C. M. & Kindb. 270
Oncophorus, Brid. 188
virens, Swartz. 188
var. nigrescens, (Schimp.) 189
var. serratus, (B. & S.) 188
Wahlenbergii, Brid 189
Orthothecium, Bruch & Schimp. 278
chryseum, Bruch & Schimp. 278

MUSCI.—*Con.*

PAGE

Orthotrichum, Hedw. 229
affine, Schrad. 230
subsp. fastigiatum, Bruch. 231
alpestre, Hornsch. 231
anomalum, Hedw. 229
Bolanderi, Sulliv. 233
Blyttii, Schimp. 229
subsp. arcticum, Schimp. 229
subsp. microblephare, Schimp. 229
Canadense, Bruch & Schimp. 233
consimile, Mitt. 231
subsp. anomaloides, Kindb. 231
cupulatum, Hoffm. 230
cupulatum, Hoffm., var. *minus*, Sulliv. 230
Douglasii, Duby 230
gymnostomum, Bruch. 233
Jamesianum, Sulliv. 232
jutlandicum, Brid. 228
Kingii, Lesq. 230
Lescurii, Aust. 230
lyellioides, Kindb. 233
Macounii, Aust. 230
obtusifolium, Schrad. 232
Ohioense, Sulliv. & Lesq. 231
papillosum, Hampe 232
subsp. strictum, Venturi. 232
Porteri, Aust. 230
psilothecium, C. M. & Kindb. 232
pulchellum, Brunton, subsp. ulotæforme, Ren. & Card. 232
Pylaisii, Brid. 229
Rœllii, Venturi 232
rupestre, Schleich. 230
Schimperi, Hamm. 231
speciosum, Nees 231
subsordidum, (Kindb.) 233
ulophyllum, Ehrh. 228
ulophyllum intermedium, Schimp 228
Venturi, Kindb 233
Watsoni, James. 233
Winteri, Schimp. 232
Paludella, Ehrh. 242
squarrosa, (Linn.) 242
Phascum, Linn. 185
cuspidatum, Schreb. 185
Philonotis, Brid. 240
acutiflora, Kindb 241
adpressa, Fergusson 241
alpicola, Juratzka 241
Arnellii, Husnot. 241
cæspitosa, Wilson 241
fontana, Brid. 240
subsp. seriata, Mitten. 240
Macounii, Lesq. & James. 240
marchica, (Willd.) 240
Muhlenbergii, Brid. 241
pumila, Kindb. 242
radicalis, Beauvois. 241

MUSCI.—*Con.*

PAGE

Vancouverensis, Kind. 241
Physcomitrium, Brid. 238
acuminatum, (Schleich.) 238
turbinatum, C. Muell 238
Plagiobryum argenteoides, R.S. Williams. 255
Zierii, (Dicks.) 255
Plagiothecium, Schimp. 299
aciculari-pungens, C. M. & Kindb 300
brevipungens, Kindb. 300
denticulatum, (Linn.) 299
diversifolium, Kindb. 300
membranosum, Kindb. 300
Muehlenbeckii, Bruch & Schimp 299
piliferum, Swartz. 299
pulchellum, (Dicks.) 299
Roesei, Hampe. 300
Sullivantiæ, Schimp 300
trichophorum, (Spruce). 299
undulatum, Bruch & Schimp. 300
Platygyrium, Bruch & Schimp. 275
repens, Bruch & Schimp. 275
Platyloma Lescurii, (Sulliv.) 302
Pogonatum, Beauv. 263
alpinum, Roehl. 264
var. subcylindricum, Kindb 264
alpinum var. *microdontium*, Kindb. 265
atrovirens, Mitt. 264
brevicaule, Beauv. 263
capillare, Brid. 263
contortum, (Menzies.) 263
Macounii, Kindb. 264
urnigerum, Beauv. 264
Pohlia commutata, Lindb. 245
gracilis, Lindb. 244
nutans, (Schreb.) 243
proligera, Lindb. 244
sphagnicola, (Brid.) 244
Polytrichum, Linn. 264
alpinum, L. 264
Behringianum, Kindb. 266
boreale, Kindb 265
capillare, Richard. 263
commune, Linn. 266
gracile, Menzies. 265
hyperboreum, R. Brown 265
inconstans, Hagen. 266
juniperinum, Willd. 266
Macounii, Kindb. 264
microdontium, Kindb. 265
Ohioense, Ren. & Card. 265
Pennsylvanicum, Hedw. 263
piliferum, Schreb. 265
sexangulare, Floerke. 264
strictum, Banks. 266
urnigerum, Linn. 264
Vanhoeffeni, Kindb. 265
Porotrichum neckeroides (Schwægr.) 299
Pottia, Ehrh. 207

MUSCI.—*Con.*

PAGE

Heimii, Fuern 207
latifolia, var. pilifera, (Brid.).. 207
truncata, Fuern 207
truncatula, Linn.. 207
Pseudoleskea, Bruch & Schimp..... 279
atrovirens, (Dicks.)..... 279
atrovirens, subsp. *tenella*, Kindb 279
denudata, Kindb..... 279
var. Holzingeri, Best,..... 279
oligoclada, Kindb..... 279
pallida, Best, var. filescens, Best 280
patens, Limpr..... 279
radicosa, (Mitt.)..... 279
var. compacta, Best..... 280
rigescens, (Wils.)..... 279
stenophylla, Ren. & Card 279
substriata, Best..... 280
Pseudoleskeella, Kindb..... 283
occidentalis, (Sulliv.)..... 283
Psilopilum, Brid..... 263
arcticum, Brid..... 263
Pterigynandrum, Hedw..... 270
filiforme, Hedw..... 270
subsp. decipiens, (Web. & Mohr.)..... 271
Pterogonium, Swartz..... 271
brachypterum, Mitt..... 271
Pterygophyllum, Brid..... 271
lucens, (Linn)..... 271
Pylaisia, Bruch & Schimp..... 275
cyrtophylla, Kindb..... 276
filari-acuminata, C. M. & Kindb 276
intricata, Bruch & Schimp 277
Ontariensis, C. M. & Kindb.... 276
polyantha, (Schreber)..... 275
var. rupestris, Best..... 275
pseudo-platygyrium, Kindb.... 276
Selwynii, Kindb..... 276
subdenticulata, Schimp,..... 276
Racomitrium, Brid..... 222
aciculare, (Linn.)..... 222
affine, (Schleich.)..... 223
canescens, (Weis.)..... 224
depressum, Lesq.. 225
fasciculare, (Schrad.)..... 223
heterostichum, Brid 223
var. micropoides, Kindb.. 223
hypnoides, (Linn.)..... 224
Jenseni, Kindb..... 225
lanuginosum, Brid..... 224
Macounii. Kindb..... 222
microcarpum, (Schrad.)..... 223
microcarpum, var. *Palmeri*, Kindb..... 224
Nevii, C. Muell..... 222
Oregonum, Ren. & Card..... 223
Palmeri, Kindb..... 224
Panschii, C. Muell.. 224
robustifolium, Kindb..... 223
Sudeticum, (Hedw.)..... 223

MUSCI.—*Con.*

PAGE

tenuinerve, Kindb..... 224
varium, Mitten..... 223
Raphidostegium, Lesq. & James.. 297
laxepatulum, Lesq. & James.. 297
recurvans, (Schw.)..... 297
Rœllii, Ren. & Card..... 297
Whrtei, Kindb..... 297
Rhabdoweisia, Bruch & Schimp.... 187
fugax, Bruch & Schimp..... 187
striata, Schrad. 187
Rhyncostegium, Kindb..... 297
membranosum, Kindb..... 300
pseudo-serrulatum, Kindb..... 298
Revelstokense, Kindb..... 298
rusciforme, (Weis.)..... 297
serrulatum, (Hedw.), subsp. eriense, Kindb..... 297
subsp. hispidifolium, Kindb 298
subintegrifolium, Kindb..... 298
Rhytidium, Sulliv..... 308
Rœllia, Kindb..... 255
simplex, Kindb 255
Schistostega, Mohr..... 236
osmundacea, Web. & Mohr.... 236
Scleropodium, Schimp..... 292
cæspitosum, (Wils.)..... 292
colpophyllum, (Sulliv.)..... 292
var. attenuatum, Grout.... 292
illecebrum, (Linn.)..... 292
Scouleria, Hook..... 216
aquatica, Hook..... 217
Seligeria, Bruch & Schimp 206
campylopoda, Kindb..... 206
Sphagnum, Dill..... 181
centrale, Arn. & Jens..... 184
compactum, DC..... 183
cuspidatum, Ehrh..... 183
var. submersum, Schpr.... 183
Duseni, Warnst..... 184
fuscum, Schpr., var. fuscescens, Warnst..... 181
var. pallescens, Warnst... 182
var. viride, Warnst..... 182
Girgensohnii, Russ..... 181
var. gracilescens, Warnst., f. squarrosa, Warnst.... 181
var. hygrophilum, Warnst. 181
var. stachyodes, Warnst.. 181
imbricatum, (Hornsch)..... 183
Lindbergii, Schpr., var. microphyllum, Warnst..... 182
molle, Sulliv..... 183
obtusum, Warnst..... 183
Pylaiei, Brid..... 183
riparium, Aongstr..... 182
Russowii, Warnst., var. pœcilum, Warnst..... 181
var. Girgensohnioides, Russ..... 181
var. rhodochroum, Russ... 181

MUSCI.—*Con.*

PAGE

tenellum, Schpr. var. rubrum, Warnst 182
teres, Aongstr, var. squarrosulum, (Lesq.) 183
Warnstorfii, Russ 182
var. purpurascens, Russ .. 182
var. versicolor, C. Jensen .. 182
Wulfianum, Girg 183
Splachum, Linn 237
ampullaceum, Linn 238
Wormskioldii, Hornem 237
Tayloria, Hook 237
splachnoides, Hook 237
tenuis, (Dicks.) 237
Tetraphis, Hedw 236
geniculata, Girgens 236
pellucida, Hedw 236
Tetraplodon, Bruch & Schimp 237
angustatus, (L. fil.) 237
bryoides, (Zoeg.) 237
mnioides, (L. f.) 237
urceolatus, (Brid.) 237
Thamnium, Schimp 299
neckeroides, Bruch & Schimp .. 299
Thuidium, Schimp 283
abietinum, Bruch & Schimp 284
Blandowii, (Web. & Mohr.) 284
Bolanderi, (Best) 285
delicatulum, (Linn.), var. repens, Kindb 284
gracile, Bruch & Schimp 283
gracile, Br. & Sch., var. *Lancastriense*, Sulliv. & Lesq .. 284
leuconeuron, Sulliv. & Lesq 285
microphyllum, Sw 283
pellucinerve, Mitt 285
Philiberti, Limpricht 285
pseudo-abietinum, Kindb 285
pseudo-gracile, Kindb 284
recognitum, (Hedw.) 284
Virginianum, (Brid.) 284
Whippleanum, (Sulliv.) 284
Timmia, Hedw 261
arctica, Kindb 262
Austriaca, Hedw 262
Bavarica, Hessler 262
cucullata, Michx 261
Macounii, Kindb 262
megapolitana, Hedw 261
Trematodon, Michx 190
acicularis, Kindb 190
ambiguus, Hedw 190
Trichodon, Schimp 205
cylindricus, Schimp 205

MUSCI.—*Con.*

PAGE

Trichostomum, Smith 210
anomalum, Schimp 210
indigens, Ren. & Card 210
Vancouvericense, (Broth.) 210
Ulota, Mohr 227
Barclayi, Mitt 229
Bruchii, Hornsch 227
connectens, Kindb 229
crispa, Brid 228
crispula, Brid 228
Drummondii, Brid 227
intermedia, Schimp 228
Ludwigii, Brid 227
maritima, C. M. & Kindb 228
phyllantha, Brid 228
Webera, Hedw 243
albicans, Schimp 246
canaliculata, C. M. & Kindb ... 244
carnea, Schimp 245
commutata, Schimp 245
subsp. gracile, Schleich 245
cruda, Schimp 245
cucullatiforme, Kindb 244
gracilis, De Not 244
Lescuriana, Lesq. & James 245
microcaulon, C. M. & Kindb ... 244
nitescens, Kindb 246
nutans, Hedw 243
var. Macounii, Kindb 243
proligera, Kindb 244
pseudo-carneum, Kindb 246
pycno-decurrens, C. M. & Kindb. 244
Schimperi, C. Muell 245
sphagnicola, Schimp 244
subpolymorphum, Kindb 243
Weisia, Hedw 186
Bruchii, (Hornsch.) 227
convoluta, C. M. & Kindb 186
Drummondii, (Hook. & Grev.) .. 227
phyllantha, (Brid.) 228
rutilans, Hedw 187
var. Ganderi, Juratzka 187
ulophylla, (Ehrh.) 228
viridula, Linn 186
Wolfi, Lesq. & James 187
Zieria, Schimp 255
argenteoides, (Williams) 255
julacea, Schimp 255
Zygodon, Hook. & Tayl 225
Californicus, Hampe 226
lapponicus, Hedw 226
Mougeotii, Bryol 226
Sullivantii, C. Muell 227
viridissimus, (Dicks.) 225

U.C. BERKELEY LIBRARIES
C026263020
QK201
A3
pt.1,6-7
BIOLOGY
LIBRARY
154522 G